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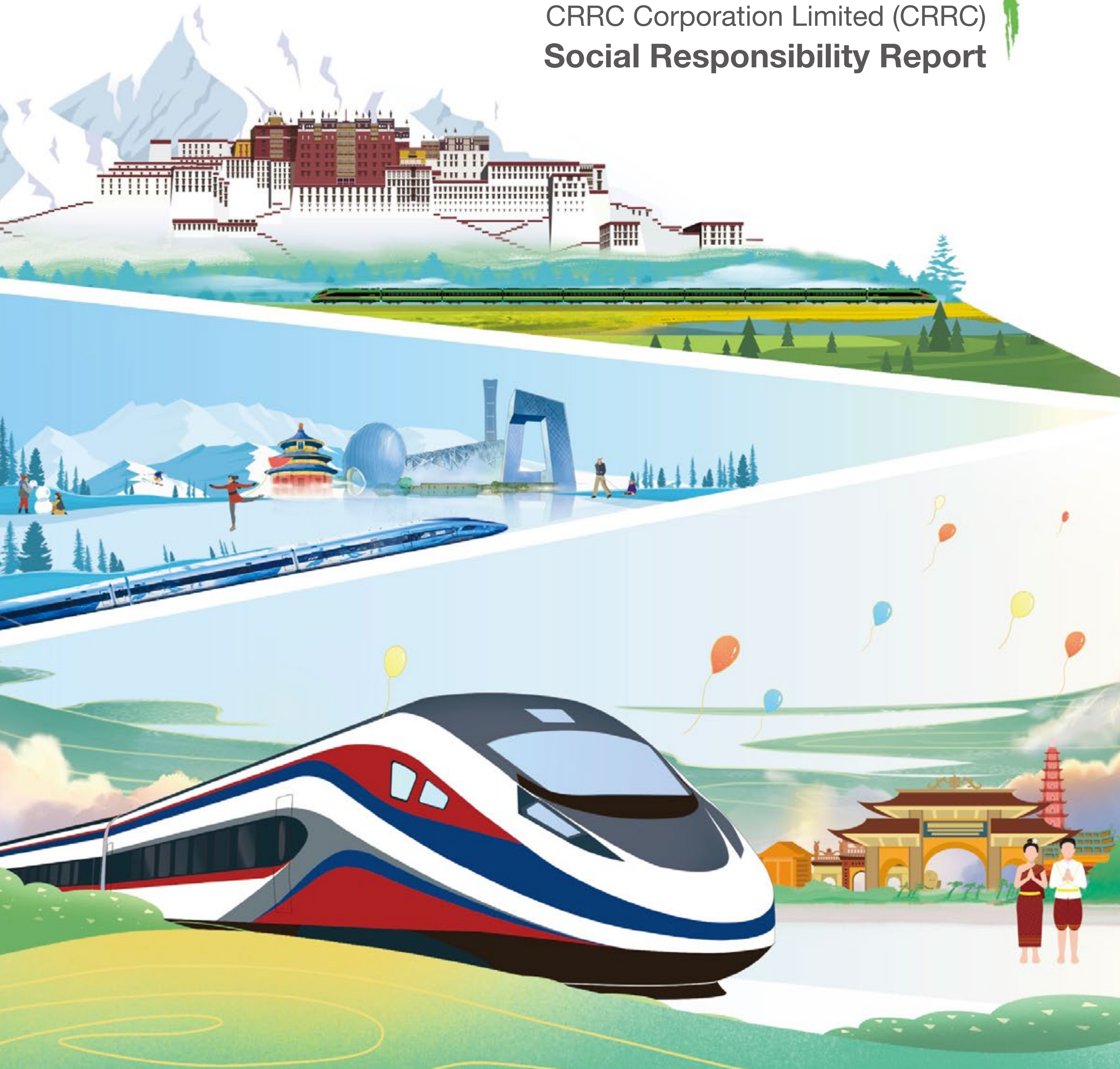
CRRC

2021

CRRC Corporation Limited (CRRC)

Social Responsibility Report



About the Report

As the seventh annual Social Responsibility Report released since the establishment of CRRC Corporation Limited (hereinafter referred to as "China CRRC", "CRRC", "the Company" and "We"), this Report accurately reflects China CRRC and its subordinate enterprises' economic, social and environmental responsibilities aiming to achieve high-quality and sustainable development.

The reporting period of this Report is from January 1, 2021 to December 31, 2021. All data hereunder has been sourced from the Company's official documents, statistical reports and financial reports, as well as social responsibility performance information collected, summarized and reviewed by the Company. Unless otherwise indicated, the currency in this Report is RMB.

The Report has been prepared under the *Guidelines for State-owned Enterprises Directly under the Central Government on Fulfilling Social Responsibilities* and *Guidelines for State-owned Enterprises on Better Fulfilling Social Responsibilities* issued by the State-owned Assets Supervision and Administration Commission (SASAC), the *Environmental, Social* and *Governance Reporting Guide* issued by the Hong Kong Stock Exchange, the *Guidelines on Self-Regulatory Supervision of Listed Companies No. 1 - Standardized Operation Report* issued by the Shanghai Stock Exchange, the *Guidelines on Corporate Social Responsibility Reporting for Chinese Enterprises* (CASS-CSR4.0) issued by the Chinese Academy of Social Sciences, the *GRI Standards* issued by the Global Sustainability Standards Board (GSSB), the *Guidance on Social Responsibility* (ISO 26000: 2010) issued by the International Organization for Standardization and the UN Sustainable Development Goals (SDGs).

You can find this Report in PDF and more information pertaining to corporate social responsibilities on the "Social Responsibility" page of the CRRC Portal (Website: http://www.crrcgc.cc).

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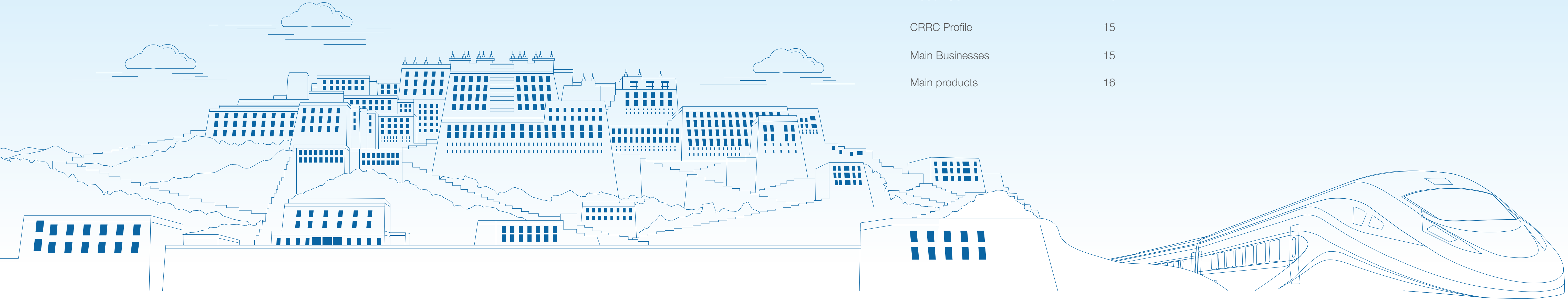

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Responsibility Features

Feature 1

Implementing the Strategic Outline and Marching ahead for a New Chapter

As the world was undergoing profound changes unseen in a century and China was standing at the intersection of two centenary goals, on April 15, CRRC officially released its *Development Strategy Outline during the 14th Five-year Plan* (hereinafter referred to as "the Outline") globally. Carrying forward the mission of "Connecting the World through Better Mobility" and strategically positioning itself as a world class high-end equipment manufacturer and system solution provider with global competitiveness centered on rail transit equipment, CRRC sets the development goals for a period to come.

Releasing the "Two-step" Development Strategy Outline

Step 1

The first step is to build CRRC into a world-class company by the 10th anniversary of its establishment after reorganization. By 2025, CRRC will become a competitive world-class high-end equipment manufacturer and system solution provider with rail transit equipment as the core. The Company will realize diverse, high-end, international, coordinated and digitalized development, and strive towards breakthroughs in industrial distribution, market expansion, scientific and technological innovation, reform and innovation, management improvement, integration of industry and finance, and Party building. Its strength will be close to or reaching the international top level. CRRC will spare no effort to build it into a respected world-class company and deliver a world-renowned brand.

Step 2

The second step is to build CRRC into a world-renowned company by the 20th anniversary of its establishment after reorganization. By 2035, CRRC will become a respected world-class enterprise with strong comprehensive competitiveness, great market appeal, remarkable brand awareness, strong global influence and good social reputation. CRRC will take a prominent position in the global high-end equipment value chain, obtain the core position in the world-class advanced industrial clusters, and become the backbone in the development of China's strong transportation network in the new era. In the process of building a community with a shared future for mankind, CRRC will strive to make important contributions to global economic development and social progress and fully demonstrate our value, earning wide recognition of the international community.

Setting Development Goals of Presenting World-Class Performance

By 2025, the Company will strive to present Five First-class Development Goals, making CRRC an enterprise with good development prospects, remarkable business performance, good social image, high level of happiness, and strong Party building.

First-class business performance	To become one of the top 300 companies of the world by the end of the "14th Five-Year Plan" period.
First-class business structure	To form a business structure with rail transit equipment as the core, the wind power equipment and new materials as important pillars for growth, and several business growth points; to realize balanced development of three business segments, namely, railway equipment, urban transportation, and strategic emerging industries by the end of the "14th Five-Year Plan" period.
First-class management system	To put in place a more mature modern enterprise system with Chinese characteristics, a more compliant and efficient operation and management system, and more modern and scientific operation and management capabilities; to form a platform-based, professional and large-scale organizational structure and resource allocation arrangement.
First-class corporate image	To make sure the Company's brand value and social responsibility rating stand at the forefront of the industry and among SOEs; to share the results of corporate reform and development, and improve employees' sense of gain, happiness and belonging.
First-class Party building	To promote corporate development through enhancing Party building; by the end of the "14th Five-Year Plan" period, Party building will play a more prominent role, with its reform and development and Party building work becoming one of the best among central enterprises, ushering in better future with high-quality business development guided by Party building efforts.

Getting a Good Start of the “14th Five-Year Plan” Period

With the blueprint for the development of the “14th Five-Year Plan” being drawn, a long journey is unfolded before us. In 2021, all CRRC employees worked hard to celebrate the 100th anniversary of the founding of the Communist Party of China and the 140th anniversary of CRRC’s very beginning, getting off to a good start to build a modern and high-quality national comprehensive three-dimensional transportation network as the Company takes on a new look.

With steady growth and good benefits, CRRC saw stable progress in its business indicators in 2021. CRRC ranked first in the selection of the most admired Chinese companies this year by *Fortune Magazine*; its brand value reached CNY126 billion, being the top in the domestic machinery and equipment manufacturing industry.

Economic

Total assets

CNY **424,540** million

Operating income

CNY **225,732** million

Total profits

CNY **10,303** million

Number of wholly-owned and holding subsidiaries

301

Social

Number of national-level R&D institutions

10

Total number of employees

160,700

Number of national-level enterprise technology centers

22

Integrity training coverage

100 %

Number of provincial and ministerial level R&D institutions

95

Investment in work safety and environmental protection technical upgrading

CNY **1,147** million

Number of overseas R&D centers

18

Work safety training coverage

100 %

Number of scientific and technological professionals

35,083

Self-directed investment in targeted assistance areas

CNY **15.25** million

Environmental

Sulfur dioxide emissions were

194.13 tons

a year-on-year decrease of

19.50 %

Nitrogen oxide emissions were

475.2 tons

a year-on-year decrease of

25.42 %

COD emissions were

459.64 tons

a year-on-year decrease of

14.68 %

Ammonia nitrogen emissions were

62.4 tons

a year-on-year decrease of

2.88 %

The number of companies that have identified as the country’s Green Factories of the sixth batch

3

The number of subsidiaries that passed the CRRC green factory evaluation

6

Launching the Carbon Peak and Carbon Neutrality Plan

Climate change has become one of the greatest challenges to the development of humanity. China made a solemn commitment to the world that it would strive to peak CO_2 emissions before 2030, and achieve carbon neutrality before 2060. CRRC has formulated a "carbon peak and carbon neutrality" action plan to fully integrate carbon reduction, zero-carbon and negative-carbon technologies for the entire industrial chain, value chain, and technology chain, spare no effort to foster innovation in energy-saving and low-carbon technology, accelerate research and development in green products such as wind power and new materials and the development of green industry, and deepen the promotion and application of energy-saving and environmental protection technologies such as light-weight materials, high-efficiency energy storage, and clean emissions, contributing to the realization of China's carbon peak and carbon neutrality target.

Releasing the Carbon Peak and Carbon Neutrality Plan

CRRC issued the *Notice on Studying and Compiling CRRC's Carbon Peak and Carbon Neutral Plan*, established a leading group and working group on the "carbon peak and carbon neutrality" target, put forward its carbon neutrality goal, specified the 6 green development concepts, 6 paths and 7 supporting measures, and built a model to comprehensively and accurately calculate the carbon data, demonstrating the political responsibility, industrial position and social responsibility of CRRC in contributing to China's carbon peak and carbon neutrality target.

Carbon neutrality goal	• To achieve carbon neutrality in the Company's operations by 2035 • Actively playing a leading role in the carbon emission reduction of the whole value chain, to strive to reduce emissions by 50% in 2035, 80% in 2040, and achieve carbon neutrality in the entire value chain by 2050	
6 green development concepts	Green investment, green innovation, green manufacturing, green products, green services, green enterprises	
6 paths	• Focus on business structure improvement and expand low-carbon new industries • Focus on energy efficiency improvement and promote low-carbon technological innovation • Focus on low-carbon product design and contribute to green and zero-carbon transportation	• Focus on green energy supply and innovate multi-energy complementary models • Focus on low-carbon solutions and provide green high-end services • Focus on low-carbon industrial chain building and create a carbon-neutral ecosystem
7 supporting measures	• Implement professional management of carbon neutrality • Fully implement carbon neutrality goal • Build a carbon neutrality management system • Enhance zero-carbon demonstration and guidance	• Increase investment in carbon neutrality • Strengthen carbon neutrality capacity building • Promote carbon neutrality alliance collaboration

Conducting Low-carbon Operations

CRRC released the *Energy Conservation and Ecological & Environmental Protection Plan during the 14th Five-Year Plan Period*, which aims to maximize energy conservation, consumption reduction and low-carbon operation through using energy-saving technologies, building an energy management and control platform, and strengthening lean management of energy.

Building an energy-saving platform

The Company built an energy management and control system platform covering the main energy categories, key energy-using processes and major carbon emission sources of all CRRC enterprises, and developed six subsystems, namely, real-time monitoring subsystem, statistical accounting subsystem, energy efficiency benchmarking subsystem, operation monitoring subsystem, carbon emission examination subsystem, and green factory index subsystem, so as to improve the ability to manage energy consumption and carbon emission of the Company.

Organizing re-training on energy and environmental protection statistics

The Company conducted re-training on energy and environmental protection statistical statements, conducting in-depth exchanges on the statistical criteria and reporting specifications of enterprise energy and environmental protection statistical statements, energy-saving and environmental protection industry statements, and nine single-item consumption statements, and giving detailed instructions on the accounting methods of greenhouse gas emissions. These efforts helped realize the smooth turnover of statisticians and ensure the quality of data reporting.

Conducting lean management of energy goals

Centering on the policy of "lean management for performance improvement, and green development through technological innovation" and energy management goals, plans and measures, the Company carried out all-round energy management and technological innovation activities to improve energy information technology management and lean management towards green and low-carbon development, making sure the annual target was met comprehensively.

Developing green and low-carbon technologies

Focusing on energy saving and environmental protection, and using intelligent advanced equipment, the Company carried out research and application of high-efficiency energy-saving technology of permanent magnet electric drive system, and research of energy-efficient technologies such as new silicon carbide permanent magnet traction technology and low-energy reverse osmosis membrane, to make sure the rail transit and energy equipment industry technologies develop towards a more intelligent, rapid, green, diversified, safe, and reliable direction.

Developing Low-carbon Industries

We actively expand emerging green industries, release the *CRRC Strategic Emerging Industries Development Plan during the 14th Five-year Plan Period*, increase green investment, upgrade management of CRRC TMT and CRRC Shandong Wind Power, vigorously develop low-carbon industries such as wind power and new materials, increase market share, make proper arrangements of the entire industry chain, strengthen product research and development capabilities, and accelerate the development of green, low-carbon and circular economy.

Promoting wind power resources

The Company innovated the CRRC wind power industry development model, systematically promoted the "industry + wind resource development" model, developed wind and solar resources in a systematic and collaborative manner, promoted the construction of the "product +" model, built a CRRC wind power system covering the entire industrial chain, and established a wind resource development system centering on CRRC Zhuzhou Institute and CRRC Shandong Winter Power, and signed a total of 30 wind and solar resources agreements. In 2021, the Company initiated the establishment of the CRRC wind resource development fund, i.e., Wind Energy Development Industrial Fund (Ningxia) Partnership (Limited Partnership), with a scale of CNY1.6 billion, which became the first industrial fund centering on strategic emerging businesses.

Houshuiquan (Luotuoshan) wind farm in Xilin Gol League, Inner Mongolia, CRRC's first proprietary wind farm, is fully connected to the grid, with an annual power of 165,000MWh

12MW semi-direct driven permanent magnet offshore synchronous wind turbine is launched — CASE

The 12MW offshore semi-direct driven permanent magnet synchronous wind turbine independently developed by CRRC ZELC is currently of this kind with the world's maximum power. After its installation, it will generate power of up to 58GWH, which can meet the annual electricity demand of 145,000 ordinary households, and reduce carbon dioxide emissions by more than 27,550 tons per year (equivalent to the emission of 18,000 cars).

Coordinating utilization of solar energy resources

Guided by the carbon peak and carbon neutrality strategy, CRRC's roof resources were used to develop and construct photovoltaic power stations and innovate the internal market-driven industrial development model, developing 6,789,500 square meters of CRRC's roof resources. In 2021, the first rooftop photovoltaic project in CRRC Sifang Institute Industrial Park invested, constructed and operated by CRRC was connected to the grid.

Making joint efforts to promote photovoltaic power generation — CASE

CRRC Tianjin and Tianjin Dongfang New Energy Power Generation Company entered a cooperation agreement to build distributed photovoltaic power stations on the roofs and carports of the manufacturing assembly warehouse and the two plants, namely, the manufacturing steel structure and the material-preparation combination warehouse, with an installed capacity of 4.2MW. The annual power generation in 2021 reached 3,188,600 kWh. In terms of the standard coal consumption of 326g/(kWh) for power generation, it can save 1,039.66 tons of standard coal, and reduce 278.75 tons of smoke and dust emissions, 92.92 tons of sulfur dioxide, 3,087.74 tons of carbon dioxide, and 46.46 tons of nitrogen oxides to the atmosphere.

Contributing to the development of green hydrogen energy

The "Qinglong No. 1" Hydrogen Fuel Cell Installation Shunting Locomotive Project of CRRC Zhuzhou Locomotive (locomotive for the CHN Energy), the City (Enterprise) Demonstration Project of CRRC (Suzhou) Hydrogen Power Technology became the hydrogen fuel cell power system for rail transit loading application with the world's largest power; prototype trial production of first-generation hydrogen fuel cell stack was completed.

China's first hydrogen fuel cell hybrid locomotive launched — CASE

In October 2021, the first hydrogen fuel cell hybrid locomotive developed by CRRC Datong was launched, marking China's major leap from product development to practical application of the rail transit equipment in new energy. It is estimated that compared with diesel locomotives, hydrogen fuel cell hybrid locomotives can reduce carbon emissions by about 80 kilograms per 10,000 tons of kilometers. After this type of locomotive is put into operation on all Jinzhou-Baiyinhua railway trunklines, about 96,000 tons per year of carbon emissions can be reduced, equivalent to planting over 6 million trees.

Message from the Chairman

Build CRRC into an Admired World-class Company

Distinguished stakeholders,

It's my honor to present you this annual social responsibility report. 2021 marked the centenary of the founding of the Communist Party of China as well as the 140th anniversary of the establishment of CRRC. In the past year, the COVID-19 pandemic continued to wreak havoc across the globe and the world underwent profound changes unseen in a century. CRRC has been committed to the aspiration and mission "serving our country by developing industry" and focuses on its development. In face of grave business conditions, CRRC remains bold-hearted and cool-minded to take up challenges and has obtained satisfying scores in the test in the first year of the "14th Five-year Plan".

CRRC bases on the new stage to map out its strategies. We have effectively translated the ardent expectations of General Secretary Xi Jinping into a grand blueprint that all CRRC staff strive for. Aiming at building an admired world-class company, CRRC has devised a strategic planning system featuring precisely-positioned, well-structured, clearly-demarcated and complementary functions over the 14th Five-Year Plan period, and we are confident and resolved to achieve high-quality development. CRRC has formulated a "carbon peak and carbon neutrality" action plan and drawn up a blueprint for neutrality to fully integrate carbon reduction, zero-carbon and negative-carbon technologies for the entire industrial chain, value chain, and technology chain. CRRC also has been fully committed to promoting the popularization and application of energy-saving and environmental-protection technologies, so as to contribute to the realization of peak carbon dioxide emissions and carbon neutrality.

CRRC is a World-class Company with Great Value. As a backbone of the nation, CRRC promotes the deep integration of railway network, transportation network and information network. As the Lhasa- Nyingchi Railway started operation, the "Fuxing" EMUs historically covered all 31 provinces, municipalities and autonomous regions in Chinese mainland. Over 4,000 EMUs run across the vast land of China. The Beijing-Zhangjiakou intelligent EMUs provided high-quality services for the Beijing Winter Olympics; the "Green Giant" and "Lancang" EMUs were put into operation on the China-Laos Railway, and "Blue Lion" electric locomotive hauled over 10,000 tons of freight. CRRC offers products of excellent quality and systematic solutions featuring life cycle management. Thus, the Company pushes forward the sustained and sound development of rail transit equipment and contributes to an ever more interconnected world.

CRRC pursues high-quality development through continuous innovation. CRRC presses on with innovation with lean management as the priority and explores the establishment of a collaborative lean management system suitable for the manufacturing industry of large-scale rail transit equipment, resulting in significant improvement in the capacity of value creation. CRRC has launched digitalization programs to enhance the empowerment of the new generation of information technology; vigorously promoted the R&D, pilot application and popularization of the intelligent operation, maintenance and logistics system of rail vehicles; created a source and hub of indigenous technologies; and fostered demonstrative examples and new highlights of scientific and technological (S&T) innovation. As of 2021, CRRC had built a team of high-level talents including over 110 national-level S&T talents and nearly 5,000 group-level experts. It also launched China's first standard subway train and 600km high-speed maglev train.

CRRC strives to guarantee safety and environmental protection and carries out green operation. CRRC has drawn a blueprint for safety and environmental protection, developed an internal smart safety management platform and put the platform in pilot operation. It has made a list of safety and environmental risks, compiled risk assessment report, strengthened supervision and inspection of safety and environmental performance, and ensured the effective functioning of the environmental management system. CRRC also made positive efforts to develop more environmentally-friendly equipment and products and remained devoted to providing the world with green, environmentally friendly and intelligent low-carbon mobility solutions. In 2021, CRRC made a proper balance between pandemic response and reform and development and successfully achieved the "5-zero" goals (including zero accidents with main responsibility, zero fires, zero environmental incidents, zero new occupational diseases and zero cluster infections).

CRRC attracts talents to build a dynamic team. CRRC has conducted investigation and formulated the human resources strategic plan for, education and training plan, and implementation guidelines for the 14th Five-Year Plan period. CRRC has systematically put forward the general approach to human resources featuring "11453" work and comprehensively built five systems of "strategy-oriented, capability management, position management, platform support, and implementation management", thus forming a globally-integrated human resources management system. CRRC cares for its employees and creates a harmonious, healthy and loving atmosphere to provide inexhaustible motivation for the high-quality development of the Company.

CRRC contributes to public welfare and fulfills social responsibility. CRRC takes on the social responsibility and mission and helps its pair region to consolidate the achievements in the fight against poverty, inject momentum into further development and enhance the development stamina, and comprehensively promote rural revitalization. In 2021, CRRC donated money and supplies and sent personnel and equipment to the places that suffered the outbreak of COVID-19 pandemic and Henan that struck by heavy rains and floods. With all these efforts, we show our care and fulfill our responsibility for the society.

Oriented towards legal compliance, we strived to build a more stable, efficient and science-based modern enterprise operation mechanism to inject strong impetus into the world economic recovery and sustainable development.

In 2022, learning from history and shaping the future, we will apply the new development philosophy, deliver impressive performance in the new era, continue to write a magnificent chapter of CRRC's high-quality development, and prepare for the successful convening of the 20th National Congress of the Communist Party of China.

Chairman of CRRC Corporation Limited, Sun Yongcai

About Us

CRRC Profile

CRRC is the world's largest supplier of rail transit equipment with the most complete product lines and leading technologies. Headquartered in Beijing, CRRC has ranked first in the world in rail transit equipment sales for many years in a row. On June 8, 2015, CRRC became listed on the Shanghai Stock Exchange and the Hong Kong Stock Exchange. In 2021, CRRC continued to rank among Fortune Global 500 and Top 100 Chinese Enterprises, secure its prominent place for many consecutive years on the list of "Most Admirable Chinese Companies" released by Fortune magazine, seeing its brand value ranking top in China's machinery manufacturing industry.

CRRC continuously enhances its sustainable operation capability, adheres to the mission of "Connecting the World through Better Mobility", and contributes to the promotion of social development and progress. To compete in the global market, we accelerate innovation in technology, product and service model, and create serialized, modular, and standardized product platforms and technology platforms to keep pace with the development needs of advanced, applicable, intelligent, green, and safe rail transit.

CRRC has set up 78 overseas subsidiaries in 27 countries and regions around the world as well as 18 overseas R&D centers in countries such as the United States, Australia, and Russia, providing products and services to 109 countries and regions across the six continents.

Main Businesses

CRRC's main businesses include: research and development, design, manufacturing, maintenance and repair, sales, leasing and technical services of railway locomotives, rolling stocks, EMUs/DMUs, urban rail transit vehicles, engineering machinery, various electromechanical equipment, electronic equipment and components, as well as electronic devices and environmental protection equipment; information consultation; industry investment and management; asset management; import and export businesses.

Railway equipment business

- Locomotives business
- EMUs (including inter-city EMUs) and passenger vehicles and freight vehicles
- Rail engineering machinery business

Urban rail transit and urban infrastructure business

- Urban rail transit vehicles business
- General contracting of urban rail transit business
- General contracting of other engineering projects business

New industry business

- Electromechanical business
- New industries business

Modern service

- Finance business
- Logistics and trade business
- Other businesses

International business

- CRRC implements an all-round operating model of "product + technology + service + capital + management"
- CRRC is committed to implementing a strategy of "localized manufacturing, localized procurement, localized workforce, localized maintenance and localized management"

Main products

MUs

It mainly includes various EMUs and DMUs that have speed of up to 200 kilometers per hour, 200-250 kilometers per hour, and 300-350 kilometers per hour and above, which are mainly used for main line passenger train services and intercity passenger train services. EMU products represented by "Fuxing" trains have independent intellectual property rights.

Locomotives

It mainly includes various DC-drive and AC-drive electric locomotives and diesel locomotives with a maximum traction power of 28,800 kilowatts and a maximum speed of 200 kilometers per hour. These locomotives are used as traction power for main line rail passenger and freight services. The Company's locomotive products have independent intellectual property rights.

Passenger carriages

It mainly includes seat cars, sleeping cars, dining cars, luggage cars, generator cars, special cars, plateau cars and double-deck railway passenger cars with a speed of 120-160 kilometers per hour, which are mainly used for main line rail passenger services. The Company's passenger vehicle products have independent intellectual property rights.

Freight wagons

It mainly includes various types of railway open-top cars, box cars, flat cars, tank cars, hopper cars and other special freight trains, which are mainly used for the freight transportation of main line railways or industrial and mining enterprises. The Company's freight vehicle products have independent intellectual property rights.

Urban rail transit vehicles

It mainly includes subway vehicles, light rail vehicles, urban (commuter) vehicles, monorail vehicles, maglev vehicles and trams, rubber-tired vehicles, etc., which are mainly used for urban and suburban commuter transport services. The Company's urban rail transit vehicle products have independent intellectual property rights.

Electrical and mechanical equipment

It mainly includes traction electric drive and network control system, diesel engine, braking system, cooling and heat exchange system, train operation control system, passenger information system, power supply system, and gear transmission equipment, which are mainly used for the Company's main line and intercity EMUs, locomotives, urban rail transit vehicles, and rail engineering machinery. Some products are independently provided to third-party customers as components. The above-mentioned products of the Company have independent intellectual property rights.

New industries

It mainly includes wind power equipment and components (wind turbine motors, blades, gearboxes, towers, converters, wind power flexible support, wind power super capacitors, etc.), trackless Autonomous Rail Rapid Transit (ART) system, new materials (vibration and noise reduction materials, lightweight materials, aramid, etc.), and machines, components and parts products in multiple industries such as environmental protection, industrial digitalization, heavy machinery, shipbuilding and marine engineering. The above-mentioned products of the Company have independent intellectual property rights.

Social responsibility management

CRRC takes the fulfilment of its social responsibilities as an inevitable requirement for deepening its corporate reform and enhancing its core competency, and continuously integrates its social responsibility principle into corporate management.

Social responsibility philosophy

CRRC applies the social responsibility philosophy of "Dedicated to Our Founding Mission and Committed to Our Social Responsibility" and adheres to the mission of "Connecting the World through Better Mobility".

Our value pursuit

Upholding the right path

Backbone of the nation for value creation

As a large state-owned backbone enterprise and a leader in rail transit equipment industry, CRRC has thoroughly implemented national strategies aimed at building national strength in transportation and manufacturing and enhancing safety, speeded up the development of advanced equipment manufacturing, and facilitated the development of China's industry towards the mid-to-high end of the global value chain. We provide CRRC technologies, products, solutions and philosophy globally and have become a world leader in the rail transit equipment industry, greatly enhancing the self-confidence and pride of the Chinese nation.

Our development pursuit

Following the right trend

Iconic brand, quality assurance

Thanks to the rapid development of China's economy and booming rail transit, CRRC has grown bigger and stronger from a follower to an industry leader, shifting its focus from bringing in foreign advantages to seeking global development. It has become the world's largest supplier of rail transit equipment with the most complete product lines and cutting-edge technologies. Insisting on independent innovation, CRRC has tackled a series of major technical difficulties and global challenges during the design, research, and development of the Fuxing EMUs. CRRC has completely independent intellectual property rights, suggesting that China's railway equipment technology has reached the world-leading level.

Our moral pursuit

Adhering to high ethical standards

Adhering to compliance as a modern enterprise

Complying with laws and regulations, CRRC has established a modern enterprise operating mechanism and system. Based on value creation and customer needs when following the direction of market-oriented reforms, we have deepened supply-side structural reforms, improved the quality and efficiency of the Company, and accelerated transformation and upgrading in an effort to build a more stable, efficient, and scientific modern enterprise operating mechanism.

Our responsibility pursuit

Shouldering major responsibilities

An Industrial powerhouse led by innovation and intelligence

As an industrial powerhouse, CRRC has always been promoting independent innovation, creation, and entrepreneurship, especially in technology, products, development models, and logistics distribution, to create the momentum for sustainable and healthy development of the Company in an effort to guide the development of the rail transit equipment industry.

Contributing to poverty alleviation through capacity building

Attaching great importance to communication with different sectors of the society, CRRC has contributed to poverty alleviation through capacity building and empowerment, helping relevant stakeholders to develop together with us in jointly building the ecological chain of sustainable and healthy development. On the basis of continuously improving its own operations, CRRC has made sustained efforts to cooperate with our shareholders in a mutually beneficial way to seek common development, assuming greater national, social and corporate responsibilities. We are striving to solve more development problems and give back to the society, shoulder greater responsibilities, and deliver more benefits.

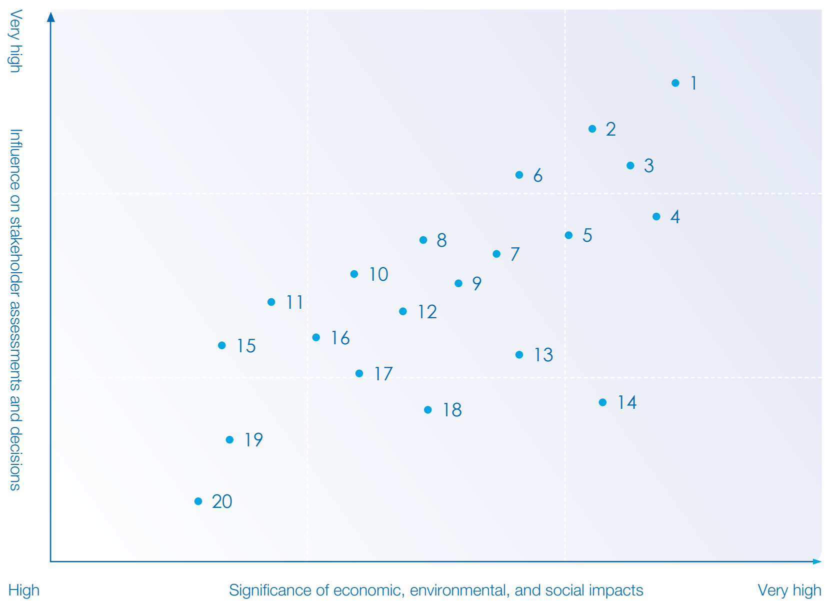
Social responsibility management system

CRRC has established a leading group for corporate social responsibility to review, discuss and decide the direction, content, and implementation of corporate social responsibility. At the same time, it has formed working groups to undertake daily management of CSR. The Company's board of directors is in charge of performing CSR, responsible for reviewing social responsibility management plans, annual social responsibility reports, and other key tasks in this regard; functional departments at the headquarters and subsidiaries are specific institutions practicing corporate social responsibilities, to make sure that social responsibility work is fully implemented throughout all levels of the Company.

Identifying material issues

We seek the ideas of the Company's internal and external stakeholders, benchmark top international companies in disclosing CSR issues, and further improve and define the content and process of the report. After identifying the issues shareholders pay attention to and judge on their importance, we finally decide on the boundary of the issues and the extent of disclosure so as to more accurately and comprehensively disclose the management, practice and performance of CSR.

1.Ensure the product quality	6.Green and environmental protection	11.Strengthen cooperation	16.Provide diversified products
2.Implement production safety	7.Employee development	12.Intellectual property management	17.Enhance client service
3.Serve the public travel	8.Operate the Company by complying with laws and regulations	13.Boosting industrial development	18.Targeted poverty alleviation
4.Strengthen the scientific and technological innovation	9.Energy conservation and emission reduction	14.Serve cargo transportation	19.Supply chain management
5.Respond to national policies	10.Promote the regional economic development	15.Employee health care	20.Community contributions



Stakeholder Engagement

We interact with the internal and external stakeholders like clients, governments, partners, employees, regulators, etc. through promotion, open day, road show, online and offline activities, incorporate their concerns and demands into corporate issues of social responsibilities development, and respond through a series of social responsibility practice.

Stakeholders	Government and regulators	Investors	Clients	The general public	Employees	Suppliers and partners	Peers and industry organizations	Community	Environment
Expectations and Requirements	• To comply with laws and regulations • To ensure the product quality • To carry out energy saving and emission reduction • To maintain and appreciate the state-owned assets • To promote the technological progress • To benefit the country and its people	• Steady growth in return on investment • Stable operation • Information disclosure and transparency	• To provide high-quality products and services • To satisfy the diversified requirements of clients • To create value for clients	• To offer safe and reliable services • To promote operational transparency	• Protecting employees' rights and interests • Ensuring occupational health • Promoting occupational capacity • Improving career paths • Work life balance	• Open, fair and equitable procurement • Abiding by relevant agreements • Mutual benefit and long-term development	• Fair operation • Win-win cooperation • Boosting industrial development	• Conducting targeted poverty alleviation • Participating in community development • Supporting philanthropy	• Energy saving and emission reduction • Developing environmental protection industry • Advocating green of office
Means of Communication	• Conscientiously implement national policies • Participate in the formulation of regulations • Be subject to regulatory assessment • Communicate with local government	• Improve profitability • Timely disclose information	• Website • Visit and interview • Customer satisfaction survey • Corporate brochure	• Enhance service capacity • Communicate and interact	• Make factory affairs public • Dialogue between the Management • Conference of employee representatives • Employee satisfaction survey • Caring for sympathy	• Joint R&D • Supplier meeting • Daily communication	• Industry conference • Association activities • Workshops	• Joint organize • Public benefit activities • Volunteer activity	• Carrying out green operations • R&D of environment-friendly products • Practicing green public welfare

A World-class Company with Great Value

Rail transit is a symbol of China's speed, China's pride, and a national business card for "going global" of China's high-end manufacturing. With the great ideal of "serving our country by developing industry and making our country stronger by manufacturing high-end equipment", CRRC stands at the forefront of the times, serving as a modern industrial chain leader, high-end equipment manufacturer and system solution provider to create value for stakeholders.

Being the Backbone of the Nation

Focusing on its main responsibilities and business, CRRC serves as the backbone of the nation. It accelerates the transformation of innovation achievements, promotes the deep integration of railway network, transportation network and information network, and strives to build a safe, green, intelligent and facilitated transportation system, providing strong equipment for the development of a strong transportation network across the country.

Facilitated passenger transport

CRRC earnestly implements the spirit of General Secretary Xi Jinping's important instructions on the operation of the "Fuxing" EMUs in the vast land of China. In 2021, the "Fuxing" EMUs historically covered all 31 provinces and municipalities in the Chinese mainland. Over 4,000 EMUs run across the country, accounting for 2/3 of the total number of high-speed trains in the world. The speed of the "Fuxing" EMUs ranges from 160 kilometers per hour to 350 kilometers per hour. Its marshalling consists of various types, from 8 to 18, which can adapt to different environments including the alpine region of minus 40 degrees Celsius and the plateau area of 5,100 meters above sea level.

Intelligent "Fuxing" high-speed EMUs serving the Winter Olympics CASE

To provide high-quality and safe services for the transportation of the Beijing Winter Olympics, the intelligent "Fuxing" high-speed EMUs "Ruixue Yingchun" were put into operation on the Beijing-Zhangjiakou High-speed Railway. The trains were the first to achieve automatic driving at a speed of 350 kilometers per hour, with functions such as automatic departure at the station, automatic operation in the section, automatic parking at the station, and automatic gate control. The intelligent "Fuxing" high-speed EMUs is also a leader in the world's intelligent high-speed rail technology. More than 2,700 monitoring points in the train capture data in real time, which greatly improves the safety of train running and the intelligence of its daily operation and maintenance. The groundbreaking 5G mobile ultra-high-definition studio is set, with 4K live broadcast capability of 6 channels. The comprehensive energy consumption is reduced by 10% compared with that of the standard EMUs, and its carbon emission in the whole life cycle is reduced by 20,000 tons in comparison.

"Fuxing" EMUs run on the plateau CASE

In June 2021, the "Fuxing" EMUs left Lhasa for Nyingchi, running on the plateau for the first time. As the climatic conditions of the Qinghai-Tibet Plateau are complex, with the bridges and tunnels of the Lhasa-Nyingchi Railway accounting for 75%, the EMUs need to use more breakthrough "black technologies".

The "Fuxing"plateau dual-source EMUs developed and produced by CRRC adopts both internal combustion and electric power. It can switch between internal combustion and electric power modes during operation. Its energy consumption per 10,000-ton-kilometer is 30% lower than that of other traction modes, and provides full diffuse and distributed oxygen supply. The rapid development of the transportation represented by the "Fuxing" EMUs have contributed to the overall economic and social development of Tibet, making travel more easier and life better for the people along the railway.

The "Fuxing"plateau dual-source EMUs run on Lhasa-Nyingchi Railway

Urban Transportation

We have accelerated the arrangements in urban rail and urban infrastructure business, made progress in the "product +" and "system +" models supported by digitalization and intelligence, and adapted and met various operating environments and diverse needs. While providing urban residents with safe, facilitated and green travel experience, we also become a beautiful scenery of the modern city.

Test run of the world's first rubber-tyred low-floor train guided by photo-electromagnetic digitalization CASE

The digital track rubber-tyred tram developed by CRRC Puzhen has a maximum running speed of 70 kilometers per hour and a maximum passenger capacity of 302 people. The train adopts a large-capacity lithium-ion supercapacitor for energy storage so that the vehicle has extremely long battery life and fast charging speed. The train adopts a digital track steering mode based on electromagnetic markers and supplemented by visual navigation and satellite navigation, which can accurately locate the vehicle in real time and control each wheel's rotating according to the required direction. The train is applied to the operation on existing rails in urban area, greatly reducing the operation cost of urban traffic.

Shenzhen Metro enters the "fully self-driving era" CASE

The first train of Shenzhen Metro Line 20 produced by CRRC Changchun is the first rail transit vehicle in Shenzhen which adopts the highest level of autonomous driving technology. The fully self-driving system equips the train with a series of functions such as automatic wake-up, automatic departure, precise parking, and automatic detection. It adopts the batch application of the vehicle-to-vehicle communication technology for the first time in the world, which optimizes the vehicle control process and greatly improves the efficiency, safety reliability of operation.

Intelligent long-rail transportation trains realize automatic paving of subway CASE

Shanghai Metro is the urban rail transit system with the longest total line length in the world. The long-rail transportation trains developed by CRRC Qiqihar are able to operate in the sections, depots and main lines of all Shanghai Metro lines. The on-board equipment of the long-rail transportation trains all adopt the mode of electric control or remote control, cooperating with the intelligent control system of the mobile manipulator through the train to complete the operation, making sure they are run with less people and higher level of safety.

Test ride of straddling monorail train on Wuhu Rail Transit Line No. 1 CASE

CRRC and Wuhu Municipal Government signed the first-phase PPP project of Wuhu Rail Transit Line 1 and Line 2, which is the largest single PPP project in Anhui Province. In September 2021, 10,000 people, including the media reporters, model workers and the general public, were invited by Wuhu Rail Transit Line 1 to participate in the test ride. Their opinions and suggestions were collected in a timely manner and adjustments were made accordingly to effectively improve the comfort and reliability of the Line.

The straddling monorail train used in Wuhu Rail Transit Line 1 was manufactured by CRRC Nanjing Puzhen, adopting the advanced GoA4 automatic operation mode. It features strong dynamic performance, great climbing ability, and small turning radius, showing advantages of low construction cost, small area, high level of safety, and strong applicability.

Trial operation of Wuyi trams CASE

The sightseeing rail transit project undertaken by CRRC Tangshan Co., Ltd. in Wuyi New District, Nanping, Fujian, makes the travel of passengers in scenic spots seamless. The project train is made of anti-corrosion aluminum alloy, which is light-weight and strong. It has a maximum operating speed of 70 kilometers per hour. The whole train is a single-articulated 100% low-floor modern tram composed of 4 cars, which is a high-end model in the tram industry, with a maximum passenger capacity of 394 people. The tram line has strong adaptability and free swings, with the door equipped with an infrared automatic switch system that can protect the passengers.

Freight Transport Access

CRRC actively promotes the high-quality development of the logistics equipment industry and provides customers with personalized, customized and intelligent solutions to logistics equipment industry. In 2021, it set a record of making nearly 10,000 train wagons per month.

High-power “Blue Lion” towing over 10,000 tons of cargo

CASE

In June 2021, the “Blue Lion” of Baotou-Shenmu Railway Group under the CHN Energy, the electric locomotive known as the “King of electric locomotives”, started a journey on the Shenmu-Shuozhou Railway to pull a10,080-ton of freight train on a 12‰ ramp. “Blue Lion” was jointly developed by CRRC ZELC and CHN Energy. With the 28,800 kilowatts of single-machine capacity and 2,280 kN of traction, it broke the world record of rail transit equipment power and became the country’s backbone. “Blue Lion” is equipped with functions such as automatic wake-up, automatic start, automatic speed governing, and automatic parking, which is safer and more reliable. “Blue Lion” also improves the noise reduction, providing a comfortable working environment for the crew.

Addressing the “last one mile” difficulty of fresh flower transportation

CASE

The cool storage intelligent cold chain equipment developed by CRRC Qiqihar equipped with the intelligent monitoring system can ensure almost zero loss of flowers during transportation. The damage rate of flowers per cool container is strictly kept below 2.5%, and the data can be monitored at any time. A bunch of freshly picked flowers can be stored in the container for up to 28 days, and can last for about 15 days after being pulled out of the container and put in a vase.

The intelligent air-rail collection and distribution system is completed and put into operation

CASE

As a pioneer in the innovation of the global port three-dimensional collection and distribution model, the intelligent air-rail collection and distribution system (demonstration section) jointly built by Shandong Port Group and CRRC Yangtze was officially completed in June 2021. The system opens up air channels that connect important hubs. The system can realize the “zero transfer” of port, land and railway multimodal transport and improve the micro-circulation of port collection and distribution, bearing great significance to the improvement of the efficiency of cargo transshipment and better contribution to the Belt and Road Initiative.

Forging Chinese Brand

With the huge impact of COVID-19 on the global market, CRRC resolutely takes on the new mission of being a world-class supplier of logistics equipment systems, forging ahead with hard work. CRRC has acquired new orders from overseas rail transit markets including the Netherlands, Switzerland, the United Arab Emirates, Thailand, Guinea, Ghana, Australia, Argentina, etc., contributing to the advancement of the Belt and Road Initiative and the sustainable development of the world.

China-Laos Railway realizes cross-border transportation

CASE

On December 3, the China-Laos Railway connecting Kunming and Vientiane was put into operation. The railway adopts the Chinese standards. The “Fuxing” “Green Giant” EMUs and “Lancang” EMUs developed by CRRC run in the Chinese section and the Laos section respectively, building a bridge of friendship between the people of the two countries.

“Lancang” EMUs combines the Chinese “Fuxing” EMUs technology and Lao cultural elements. It enjoys advanced technology, safety and reliability, large capacity, comfortable passenger experience and economical operation. The “Lancang” EMUs has a maximum speed of 160 kilometers per hour. The temperature of its air conditioner can be adjusted intelligently and the seats are ergonomically designed. There are standard power sockets of Chinese and Lao standards under each group of seats, accessible seats for people with disability and identification for the blind are also equipped with.

In addition, the China-Laos railway international freight trains are all driven by the HXD3C electric locomotives of CRRC Dalian, meeting the conditions of the railway with continuous long ramps along with high temperature and high humidity environment. The freight train runs for less than 30 hours. The low cost and high speed of cross-border transportation have brought new development opportunities for many industries along the railway.

“Lancang” EMUs arrives at Vientiane Station

Completing the largest order for China’s railway freight trains export to Europe

CASE

In April 2021, all 140 sets of Laaers 560.3 railway freight trains exported by CRRC Qiqihar to Deutsche Bahn AG were finished and delivered. It was the first time the German company purchased complete railway vehicle outside of Europe. The Laaers 560.3 railway freight trains are used to load various types of cars, and meet or exceed similar European products in terms of lightweight materials, low noise, and operational reliability. The train has obtained EU model authorization and vehicle market authorization. This type of railway freight train manufactured by CRRC has fully completed the technical review process required by the EU, with its manufacturing capacity and product quality meeting the related EU requirements.

Contributing to Xinjiang, China-Afghanistan train

CASE

In November 2021, a freight train carrying more than 1,000 tons of aid and living and production supplies pulled by HXD3C electric locomotives departed from Urumqi West Station to Mazar-e Sharif, Afghanistan. The launch of the Xinjiang, China-Afghanistan train opened up a corridor for the transportation of humanitarian aid supplies.

The HXD3C electric locomotive is developed by CRRC Dalian. It can fully adapt to the environmental conditions of the railway in Xinjiang. It enjoys advantages of large traction force, high speed, zero emission, safety and low life-cycle cost. The use of this type of locomotive has contributed to the efficient, energy-saving and high-quality development of railway transportation in Xinjiang.

Chinese rail train runs in Chile for the first time

CASE

In October 2021, the 120-kilometer-per-hour EMUs tailor-made by CRRC Sifang for Chile began to operate on Bio-Bio Metro Line 1, Bio Metro Line 2 and Cortoraha line, which is expected to transport more than 5 million passengers per year. The body of the new train is designed in accordance with the most stringent crash safety standards to ensure the safety of drivers and passengers. The windows are made of temperature- and sound-insulating panels made of special materials to adapt to cold and rainy weather while reducing noise. Equipped with sand sprinkling device, the train has good traction braking in wet or rainy conditions.

> "This is the first time that Bio-Bio has new and state-of-the-art trains. This type of new train is faster, quieter, less polluting, and carries more passengers. We are proud to have the train truly return to our people's life, that means better quality of life."

Quality Product Service

CRRC's products carry tens of billions of trips every year, over 4,000 EMUs and 78,000 subway trains are put into operation every day, with an average daily passenger volume of nearly 65 million. CRRC's product quality has ensured the public safety of the country and the safety of passengers' lives and property.

CRRC adheres to the lifeline of product quality, improves product quality from multiple aspects such as design, process, production, new technologies and new measures, and promotes the implementation of "CRRC Q" in all sub-enterprises. 22 first-level manufacturing subsidiaries have completed "CRRC Q" quality management maturity self-assessment. CRRC builds a quality management platform in a scientific way, establishes a collaborative management system for the entire product chain, the entire supply chain, and the entire value chain, strengthen product process control, and ensure the quality and safety of the whole machine. In 2021, CRRC won 1 first prize and 5 second prizes of Quality Technology Award issued by China Association for Quality.

CRRC has ensured operation safety of high-speed railway and urban rail transit in a high-quality way. With first-class project management and control capabilities, CRRC strives to respond to customer needs in real time, attaches great importance to customer privacy protection, fully protects customer rights and interests, and provides users with system solutions of full life cycle management.

Guaranteeing the operation of plateau trains

CASE

After the opening of the EMUs trains on the Qinghai-Tibet Plateau, to ensure the safe operation of the EMUs on the snow-covered plateau, CRRC Dalian has formulated the detailed plans including the *After-sales Service Manual* and *Operation Guarantee Plan*, and carried out menu-based training, maintenance, technical support, emergency response, extra staff support, etc., providing all-weather services. CRRC mobilized the backbone staff, organized the operation support team to station in the Lhasa service station, and went all out to conduct the operation and maintenance support of the internal combustion powered vehicle of the plateau dual-source "Fuxing" EMUs.

Providing maintenance services for China-Laos Railway

CASE

To ensure the safe and stable operation of the China-Laos Railway, with CRRC Dalian taking the lead, and the participation of CRRC Sifang and related supporting companies, an integrated operation and maintenance guarantee management model was established, featuring one leading company, multi-party coordination, established standard, and formed system. The management model aims to provide full-life-cycle services, conducting service layout according to "one line, three stations and two points", and comprehensively conducting the integrated operation and maintenance guarantee of the China-Laos Railway.

The geological and topographical conditions along the railway are complex, with many long slopes above 20‰, placing higher requirements for all kinds of equipment and facilities. The "nanny van" GCD-450 heavy rail car developed by CRRC Yongji Electric can meet the traction and braking requirements on long slopes. The rail car is flexible and safe to operate. It can efficiently undertake the tasks of transporting materials, tools and personnel in line maintenance work in an environmentally-friendly manner and greatly reduce costs.

Concerted Efforts through Win-win Cooperation

Insists on promoting development, innovation and win-win results through cooperation, CRRC conducts targeted innovation and intelligent upgrading of supply chain systems and mechanisms, improves the modernization of the industrial chain and supply chain, and joins hands with enterprises in the upstream and downstream to integrate horizontally and vertically in an effort to jointly promote the high-quality development of the rail transit industry.

Improving Supply Chain Management

CRRC comprehensively improves procurement management, builds a responsible industrial chain and promotes more sustainable supply chain development by leveraging the advantages of centralized procurement, promoting intelligent logistics, improving benchmarking, advancing digital transformation and fostering supply chain recycling.

CSR award

Construction of Industrial Intelligent Logistics Cloud Platform Based on Business Integration was rated as a typical example of digital economy development of global industrial chain and supply chain

Leveraging the advantages of centralized procurement

Actively responding to the rapid expansion of the centralized procurement catalogue, CRRC has standardized the procurement process, established a standardized cross-project and cross-enterprise centralized procurement process, with the implementation rate of the centralized procurement catalogue reaching 100%. CRRC reasonably determines the procurement strategy, strives to explore new pricing methods for centralized procurement, and goes all out to promote cost reduction of centralized procurement.

Promoting intelligent logistics

CRRC built the main modules of the industrial intelligent logistics platform, improved the integration model in the Qingdao region, and realized the integrated, network-based and platform-based operation of the logistics business of centralized collection, storage and transportation of upstream supplies and centralized collection, storage and distribution of downstream supplies; improved and broke down tasks of intelligent logistics program for strong transportation network and promoted the deployment of major scientific and technological projects in the "14th Five-Year Plan" period, and organized the formulation of the "14th Five-Year Plan for the Industrial Intelligent Logistics Business of CRRC.

Improving benchmarking of supply chain

CRRC formulated the *"14th Five-Year Plan" for Procurement and Supply Chain of CRRC*. It reconstructed the CRRC procurement and supply chain management system, and planned the formulation or revision of 21 management measures or specifications; organized the first phase of CRRC's supply chain expert training program, and provided middle-level management personnel responsible for procurement and supply chain in subsidiaries with training on the knowledge system of modern supply chain; selected subsidiaries with best practices in CRRC procurement and supply chain building.

Advancing digital transformation of supply chain

CRRC basically completed the construction plan of the CRRC industrial chain and supply chain collaboration platform based on the industrial Internet architecture, realizing full coverage of online procurement by manufacturing subsidiaries; the data reporting, hierarchical summary review, and data summary analysis functions of the SASAC data supervision system are already available for online applications, realizing more open and integrity supply chain procurement.

Fostering sustainable development of supply chain

continuously increased the transaction volume of waste materials and the number of platform registrations, promoting more environmentally-friendly and sustainable development of the industrial chain. In 2021, the transaction volume of recycled materials exceeded CNY 1 billion, and the online transactions of all-level enterprises were summarized. Of the 328 domestic enterprises, 285 have completed registration and 172 have conducted transactions. The 152 manufacturing enterprises reached a registration ratio of 94% and transaction ratio of 81%.

Conducting Extensive Cooperation

Laying emphasis on cooperation management and exchanges with external partners, CRRC strives to improve cooperation management, conduct cooperation and exchanges, sign cooperation agreements, and realize resource sharing by establishing alliances and pushing forward investment cooperation so as to achieve win-win cooperation with partners.

Signing strategic cooperation agreements

In 2021, CRRC entered 13 strategic cooperation agreements with state-owned enterprises including CITIC Group, Power China, Shaanxi Construction Engineering Group, Taiyuan Iron & Steel, Jilin Energy Investment, local governments of Ningxia, Jilin, Tianjin Binhai New Area, Tangshan, Zhangzhou, Baise, and Yancheng, and universities such as University of International Business and Economics.

Conducting exchanges with external partners

CRRC conducted cooperation and exchanges with CITIC Group, MTR Group, AVIC, and China Aerospace Science and Industry Cooperation, as well as the local governments of Jilin Provincial Department of Commerce, Tianjin Binhai New Area, Ganzhou City, Sanmenxia City, and Changshu Economic Development Zone.

CRRC Industrial Park opened

CASE

In June 2021, CRRC Beijing Rail Transit Equipment Industrial Park (hereinafter referred to as the CRRC Industrial Park), located in the high-end manufacturing base of Fangshan District, Beijing, was unveiled. It is a model project for the cooperation between government and enterprise in jointly building a new landmark of high-precision industrial clusters in southwest Beijing.

The industrial park will be committed to building a demonstration base for intelligent manufacturing and maintenance of high-end rail transit equipment in China, and a national innovation center for urban rail transit industry. It has now developed the capacity for manufacturing and maintenance of urban rail equipment, guiding the development direction of intelligent manufacturing of high-end rail transit of Beijing. It will effectively support the upgrading of the Beijing-Tianjin-Hebei urban rail transit equipment industrial chain.

Adhering to Integrity and Innovation

CRRC strives to implement the innovation-driven development strategy, and explore the establishment of a collaborative lean management system that is in line with the characteristics of scale rail transit equipment manufacturing. CRRC's ability and level of corporate value creation have been significantly improved, with its brand effect of enterprise management system and capacity modernization building yielding remarkable progress, injecting new momentum into its sustainable, sound and high-quality development.

In 2021, CRRC was awarded 2 first prizes and 6 second prizes of the National Enterprise Management Modernization Innovation Award.

Gathering Innovation Momentum

CRRC insists on corporate development, seeks technological breakthroughs as the foundation, enhances top-level design, systematically promotes the three major technological innovation projects, namely, system innovation, technological innovation and capability innovation, deepens the reform of the technological system, improves the landscape of innovation, perfects the innovation system, improves the innovation mechanism, unleashes innovation potential, and creates places of original technology.

Scientific and Technological Innovation Management

CRRC always adheres to scientific and technological innovation as the primary driving force, actively undertakes the pilot task of the reform of China's scientific and technological system, actively undertakes the construction of the national high-speed train technology innovation center, comprehensively promotes the implementation of major scientific and technological research projects, and makes sustained efforts to strengthen independent innovation, exploring a path towards better development through scientific and technological development.

Strengthening the top-level design

CRRC released the *14th Five-Year Plan for Science and Technology Development*, put forward systems including the *Guidelines on the Reform of the Science and Technology System* and the *Guidelines on the Development of Experimental Verification and Simulation Capability*, and formulated and implemented the base of original technology of advanced rail transit equipment and the work plan of the leader of modern industrial chain, forming a systematic supporting system and mechanism.

Enhancing technological research and development

CRRC headed 13 projects in 7 directions of the national key R&D program "Advanced Rail Transit". It organized and conducted research on the base of original technologies, as well as special research on the quality control of non-functional structures of locomotives and the re-inspection and re-verification of key components of the locomotive running gear.

Conducting CRRC's "14th Five-Year Plan" major science and technology project

It set up CRRC's "14th Five-Year Plan" major science and technology project, establishing 26 R&D directions, 28 projects and 117 subjects in five technological areas, namely, rail transit, modern logistics, digitalization/intellectualization, carbon peaking/carbon neutrality, and remanufacturing.

Holding a scientific and technological innovation conference to point out the development direction

CASE

In September 2021, CRRC held a scientific and technological innovation conference to specify the development direction of scientific and technological innovation in the "14th Five-Year Plan" period. The conference pointed out that it is necessary to deepen the reform of the scientific and technological system, accelerate the development of key products, enhance key technology research, improve independent innovation capabilities, promote digital transformation in a coordinated way, improve scientific and technological management system, and implement talent development strategy to meet the new challenges brought by the scientific and technological innovation during the "14th Five-Year Plan" period, and set up CRRC's "14th Five-Year Plan" major science and technology project, providing strong support in science and technology for the high-quality development during the period.

Technological Innovation Team

Zhou Guifa
Scientist of CRRC Zhuzhou Institute

Li Guoping
Scientist of CRRC Sifang Institute

CRRC gives full play to the role of talent as the most important resources, innovates the evaluation and incentive mechanism, fully integrates innovative elements such as scientific research strength and capital resources, builds technological innovation platforms, unleashes technological innovation momentum, and contributes to the Company's improvement of technological innovation capabilities.

Building a scientific and technological platform

CRRC accelerates the construction of the national innovation center and the optimization and reorganization of national laboratories, and improves the scientific and technological innovation system. It creates an open talent environment centering on the innovation chain, builds an innovation platform, accelerates the construction of the national innovation center and the optimization and reorganization of national laboratories, and plans to build 7 laboratories. By the end of 2021, CRRC had 27 national-level skill master studios and 8 national model worker innovation studios.

Enhancing the building of talent team

CRRC establishes and improves the "team + project + talents" training model, taking the opportunity of major national scientific and technological projects, national key R&D programs, and major CRRC projects to cultivate a group of strategic scientists and academician reserves who have the ability to implement top-level design for national development and industrial development; trains a group of leading talents in strategic science and technology who can grasp the general trend of science and technology in the world and make the right judgment on the development direction of science and technology in the industry. CRRC improves the incentive mechanism and evaluation mechanism, gives scientific professionals greater independence in the transformation of achievements, and improves the scientific and technological talent evaluation system centering on innovation ability, quality, effectiveness, and contribution. Relying on the scientific and technological innovation center, CRRC improves the ability and performance evaluation mechanism of scientific and technological talents, and fully motivates them. By the end of 2021, CRRC had a high-level talent team including more than 110 national-level scientific and technological talents and nearly 5,000 group-level experts.

Scientific and Technological Innovation Achievements

CRRC accelerates the transformation of scientific and technological achievements, applies these achievements in the practice of innovation and development, and realizes the launching of the first Chinese standard subway train and 600-kilometer high-speed maglev system, providing strong support and impetus for major national strategies and industrial scientific and technological development.

Participating in standard setting

CRRC has released and chaired **8** international standards and participated in **1** international standard. It organized "unveiling" of the technical standards of the railway industry in 2021, and presided over the revision of **4** standards; organized the application of **10** national standards and **23** group standards for urban rail transit. It launched **118** CRRC technical standards.

Respecting intellectual property rights

CRRC completed **6,000** patent applications, including **4,000** invention patent applications and 500 overseas patent applications; **3,000** authorized patents, including **1,500** inventive patents and **200** overseas patent authorizations. In the 22nd China Patent Awards, CRRC won **2** gold awards, **2** silver awards, and **13** excellence awards, ranking first among SOEs in the number of gold awards.

Tackling core technical problems

CRRC has conducted innovation in **6** key technologies, including dual-source power integration of internal combustion and electric power in a plateau environment, and cross-line operation in electrified and non-electrified sections.

In July 2021, CRRC launched the world's first high-speed maglev transportation system with a design speed of 600 kilometers per hour with completely independent intellectual property rights

China's first Chinese standard subway train rolled off the assembly line

CASE

In June 2021, China's first Chinese standard subway train, which was developed by CRRC, rolled off the assembly line in Zhengzhou, marking China's major innovation breakthrough in the subway vehicle technology. Based on the Chinese standards, the train is an independently developed brand new product platform with leading technology that adopts the design concept of standardization, modularization and serialization, inherits the experience in the operation of existing subway trains and takes into account the demand of domestic subway users.

Chinese standard subway trains have completely independent intellectual property rights, and the coverage "Chinese standard" reaches more than 85%. The development and demonstration application of Serialized China Standard Subway will lead the "standardized" development of China's urban rail equipment, reduce the entire life-cycle cost of urban rail transit, and enhance the core competitiveness of China's urban rail transit equipment technology.

China's first dual-current rail vehicle was unveiled in Chongqing

案例

In November 2021, with the participation of CRRC Changchun Railway Vehicles Co., Ltd., the rollout ceremony of China's first dual-current rail vehicle and the completion ceremony of China's first dual-current test line & the achievement launching conference of the research and application demonstration technology project of dual-current rail transit vehicles was held in Chongqing. The project team carried out the test by building the first dual-current test line in China and using the core technology of AC-DC drive automatic switching to realize the function of automatic switching between AC and DC drive sections without the pantograph being lowered, overcoming many problems such as DC-AC conversion technology and automatic switching technology in vehicle operation.

Accelerating the Construction of Digitization and Intellectualization

Insisting on developing the digital economy as a key increment for high-quality development, CRRC released the informatization development plan for the "14th Five-year Plan" period, completed the review of the overall plan for the management and control of the big data platform, established a special working group, and initiated the implementation of industrial digitization. It makes sustained efforts to promote the empowerment of a new generation of information technology. CRRC's "Innovative Application of Beidou-based Rail Transit Vehicle Positioning and Control" was selected as one of the top ten examples of Beidou application in 2020 by central enterprises. Focusing on the intelligent development of rail transit and digital and intelligent equipment industry, CRRC vigorously promotes the research and development, pilot application, and promotion of intelligent operation, maintenance and logistics systems of rail vehicles, and actively explores ideas to support management model innovation through technological innovation. In 2021, 2 digital workshops and 11 intelligent production lines were built. 5 products including railway traffic recording devices won the sixth batch of single-item champions in the manufacturing of the Ministry of Industry and Information Technology.

Building the world's first bogie intelligent manufacturing workshop

CASE

CRRC ZELC has managed to overcome more than 1,000 difficult problems and built the world's first bogie intelligent manufacturing workshop, realizing the digitization and flexibility of the manufacturing process and the integration of design-process-manufacturing data. Thanks to these efforts, its overall production efficiency was improved by more than 30%, and the operation costs reduced by more than 20%. CRRC ZELC established a research team to design tools more suitable for the site, enabling the bogie intelligent manufacturing project to obtain the intelligent manufacturing maturity assessment level 4 certification (highest level in the industry) by the Ministry of Industry and Information Technology (the highest level in the industry) in an effort to contribute to the improvement of China's intelligent manufacturing standard system.

Building a digital factory with a national-level "strongest brain"

CASE

In 2021, CRRC Zhuzhou Institute formulated the "Digital 1410 Strategy" to build its Factory in Zhuzhou "Power Valley" into a digitalized one. Through the R&D and upgrading of 18 categories of intelligent production and inspection equipment, it built a digital workshop for the preparation, molding and post-processing of wind turbine blades, and constructed 12 digital production lines for large-scale wind turbine blades, increasing the production efficiency by 55.30% and reducing the product upgrade cycle by 40.70%. It built a data warehouse and established an intelligent operation center for wind power blades. These efforts managed to improve factory production efficiency, ensure product quality, and reduce management and manufacturing costs.

Improving Management

CRRC deepens the reform of state-owned enterprises, aligns itself with world-class companies, promotes lean management, enhances core competitiveness and develops "soft power" through management innovation, promotes better and faster development, and contributes to the development of the real economy.

Being a Model of Reform

CRRC resolutely implements the three-year action for the reform of state-owned enterprises, advances tasks following the schedule, ensures the full implementation of various tasks, objectives and key measures, promotes the "scientific and technological SOE reform", "mixed ownership reform" and "double-hundred action" in an integrated manner, and deeply implements the reform of the market-oriented operation mechanism, accelerating the unleash of development vitality. In 2021, the overall completion rate of the three-year action plan for CRRC's reform reached 94%, and a number of central enterprise reform models emerged represented by CRRC Zhuzhou Institute.

CRRC was appraised as a role model of the special reform of state-owned enterprise reform of "learning from good examples, focusing on implementation, and promoting reform", and was listed among the key enterprises for the publicity of state-owned enterprise reform by the Publicity Department of the Communist Party of China.

The reform practices of CRRC Yangtze Group and CRRC Tangshan was incorporated in the case collection of "Scientific and Technological Enterprise Reform Demonstration Action" of the State-owned Assets Supervision and Administration Commission (SASAC)

CRRC's management practices of the "appointment system, tenure system, and contract management" was selected among the first batch of good examples by the SASAC in terms of deepening the reform of the above-mentioned three systems.

The reform of the market-oriented operation mechanism of "full levels, full coverage, full implementation and full elements" as well as "higher level organizations can increase and simply, managers can be promoted and demoted, employees can enter and quit, income can rise and fall, and talent can foster and introduce" has been fully launched, and the two guidelines on institutional reform and "Two Positionings and Two Excellences" have been issued and implemented.

CRRC Zhuzhou Institute was awarded as a role model of the national "Double Hundred Enterprises".

Zhuzhou CRRC Electric became listed on the Science and Technology Innovation Board, enhancing the momentum of innovation and entrepreneurship.

Aligning itself with World-class Companies

Making a coordinated deployment

CRRC formulated the *Notice on Further Promoting the Key Work Task of Management Improvement Actions in 2021*, and held the on-site promotion meeting for benchmarking world-class management improvement actions & lean management to advance the implementation of key tasks for 2021.

Creating "three benchmarks" in an all-round manner

CRRC developed the CRRC *Action Plan for Creating Management Improvement Benchmarks*, the *Notice on Matters Concerning the Creation of Management Improvement Benchmarks* and the *Notice on Releasing and Distributing CRRC's Work Plan of Creating "Three Benchmarks"*, organizing the "Three Benchmarks" campaign.

Promoting the "Strong Foundation Project"

CRRC integrated the "Strong Foundation Project" with management improvement actions and formulated an annual list of strong foundation projects. All-level subsidiaries planned to carry out 487 key breakthrough projects and promote 2,934 projects, laying a solid foundation for CRRC development and advancement towards a world-class company.

Enhancing supervision and evaluation

CRRC developed a supervision information system for online management improvement action, realized online visual management of the completion of task lists, formulated evaluation methods for benchmarking management improvement, and ensured the completion of annual tasks. It also improved the information management platform for management innovation achievements and organized the appraisal of the 6th CRRC management innovation achievements.

Deepening Lean Management

Releasing CRRC's lean management implementation plan during the "14th Five-year Plan" period

CRRC created the value creation management system for digitalized, high-end, diverse, international, and coordinated development, built the "5 aspects (synergy, leadership, sustainability, human resources and driving force)" lean management capability improvement system, and drove the three dimensions of "strengthening the foundation, empowerment, and advancement", and deepened the "4" lean work platforms, namely, organizational guarantee platform, talents development platform, knowledge sharing platform, information management platform, contributing to the attainment of its goal of presenting first-class business performance, business structure, management system, corporate image, and Party building.

Implementing annual key actions for lean management

CRRC held a video conference on lean management work, formulated the Key Points and Plans of Lean Management Work in 2021, and arranged key focus and main tasks of the year. It organized two session training camps for lean leadership and lean backbone workforce. It enhanced the cultivation of lean management concepts and talents by holding lectures, themed forums, benchmarking enterprise learning sessions, and high-level leadership workshops.

Promoting the construction of lean management system

CRRC organized the revision of the CRRC Lean Management System Evaluation Standard Guidelines (Trial), highlighting the lean value orientation and enhancing the standardization of evaluation. It made sustained efforts to promote the implementation of lean system standards, and continued to expand in digital lean manufacturing system, lean operation, lean R&D and supply chain.

In 2021

CRRC established standard workstations
9,728

lean production demonstration area (lines)
695

Lean workshops
258

Simulated line projects
147

Lean R&D projects
38

Lean supply chain projects
44

Online management projects
167

Management platform projects
140

CRRC organized the implementation of labor productivity improvement projects
58

Digital and intelligent transformation projects
74

Protecting the Environment

CRRC is actively implementing General Secretary Xi Jinping thought on ecological civilization, adhering to green and low-carbon development, innovating in green technologies, expanding green industries, constructing green manufacturing systems, establishing green factories, and driving operations and development in accordance with the principles of efficient resource utilization and low-carbon development. In this manner, CRRC will realize cleaner manufacturing and greener transportation while moving towards more environmentally friendly and lower-carbon development.

Green Systems

CRRC has strengthened environmental management measures, clarified its environmental responsibilities, strove for environmental information disclosure, conducted environmental supervision, enhanced environmental awareness through environmental protection activities and training, and continuously optimized its green development systems.

Strengthening Environmental Management

CRRC issued the *"Notice on Further Strengthening Environmental Protection"*, carried out identification and evaluation of compliance obligations such as applicable environmental regulations, implemented the "seven checks" for environmental issues, and carried out actions such as green energy evaluation and inspections, environmental risk assessments, and three-year follow-up evaluations of pollution prevention and control. When combined with increased supervision and inspection of environmental protection performance, these measures have ensured the effective operation of the Company's environmental management systems. The Company's environmental management system certification pass rate in 2021 was 100%, with no significant or unexpected environmental incidents throughout the year.

Enhancing Contaminant Monitoring

CRRC has implemented the "three synchronizations" principle, enhanced its "three synchronizations" mechanisms, reduced consumption, decreased pollution and control risks from the source, and ensured legal compliance. In accordance with the requirements of pollutant discharge permits, each enterprise prepared an annual environmental monitoring plan to monitor the discharge of pollutants and realize a 100% monitoring rate of pollution sources. The Company has also strengthened the operational monitoring and management through online monitoring equipment for wastewater discharge outlets, kept abreast of fluctuations in the discharge of exhaust gas and wastewater pollutants, and disclosed environmental monitoring information on relevant websites in a timely manner. CRRC Changchun, CRRC Tangshan, and CRRC Qiqihar formulated annual soil self-monitoring plans, carried out soil status evaluation and monitoring, and investigated potential soil pollution and environmental hazards.

Furthering Environmental Supervision and Control

CRRC printed and published the *"2021 Work Plan for Environmental and Energy Supervision and Monitoring, Energy Audits, and Energy Conservation and Environmental Protection Acceptance"*. A third party was entrusted to carry out pollutant discharge monitoring and energy efficiency testing for 35 enterprises, a comprehensive energy and water conservation audit for 15 enterprises, and acceptance of 20 completed energy conservation and environmental protection construction projects.

The Company carried out pilot evaluation of the standard management of solid waste and the tenth round of environmental protection supervision, established an environmental protection inspection team to conduct the tenth round of environmental inspections on 10 enterprises, and the solid waste evaluation of 8 pilot enterprises for standard management.

Environmental Risk Management

CRRC carried out its 2021 environmental risk assessment in a comprehensive and in-depth manner. Subsidiaries actively worked to identify changes in risk and comprehensively implemented measures for management and control, formulated measures and plans for rectification, carried out score-based evaluations, and formulated the CRRC Environmental Risk Assessment Report (2021).

Preparing Pollution Contingency Plans

In accordance with their individual circumstances, each company across CRRC formulated or supplemented contingency plans for weather contamination, hazardous waste, and other conditions. Emergency drills for eco-friendly paint leaks, chemical leaks and combustion incidents, and flood control were carried out to improve the emergency rescue and evacuation capabilities of company systems and personnel.

Performing Environmental Benchmarks

CRRC benchmarked the key green performance indicators of world-class enterprises, comprehensively analyzed the best practices of them, identified its own flaws, furthered innovation in its management, and enhanced its green performance levels.

Environmental Information Disclosure

In strict accordance with the requirements of national ministries and commissions, CRRC has used its own network resources and those provided by various environmental protection departments to provide basic information on its environmental protection efforts, production and discharge of major pollutants, construction and operation of pollution prevention and control facilities, environment impact assessments and other environmental protection administrative licenses, and environmental incidents on a regular basis. Environmental contingency plans and monitoring of pollutants were disclosed, and the Company has always been ready to accept societal supervision.

Raising Environmental Awareness

Special training courses on environmental protection were held throughout the year, representing a total of 46,600 trainee attendances. CRRC also actively engaged in the SASAC "Special Online Training on Energy Conservation and Low-Carbon Development for SOEs", representing a total of 35,000 participants. With a focus on the theme of "harmony between humankind and nature", CRRC Changchun carried out energy shortage experience activities, the CRRC QSYRI held training with the theme of *"Opportunities and Challenges of Dual Carbon Goals"*, and CRRC Dalian held a "Dual Carbon Goals" special lecture.

CRRC's smart training system was used to carry out pollutant discharge permit, World Environment Day, and Energy Saving Week knowledge activities. The Company has retrofitted public area lighting with sound and light control switches, strove to popularize green office and green living models, and created a positive atmosphere for all employees to care for and protect the environment.

Green Factories

CRRC has led the green transformation of the industry through pollution prevention and resource management measures, realizing eco-friendly raw materials, clean production, waste recycling, and efficient use of resources and energy. In 2021, six subsidiaries passed CRRC green factory evaluation, bringing the number of certified subsidiaries to ten. CRRC Dalian, CRRC Zhuzhou Institute, Tianjin CRRC Wind Turbine Blade Engineering Co., Ltd. and others were certified as the sixth batch of national green factories.

In 2021

the comprehensive energy consumption of total industrial output (comparable price) was

0.0243 tons of standard coal/CNY10,000

the comprehensive energy consumption of added value (comparable price) was

0.101 tons of standard coal/CNY10,000

Advancing Clean Production

To improve the energy and environmental management, further employee awareness of clean production, and realize the goals of energy conservation, consumption reduction, pollution reduction, and efficiency enhancement, all companies across CRRC have actively engaged in clean production work and driven the implementation of clean production plans.

Exhaust Emissions Management

CRRC has continued to engage in the responsible disposal and treatment of exhaust gas. In 2021, the Company's sulfur dioxide emissions were 194.13 tons, while its nitrogen oxide emissions were 475.2 tons, representing a year-on-year decrease of 19.50% and 25.42% respectively.

CRRC Changchun moved from wet to dry treatment for 10 spray booths in its old factory area, while its new factory area has been equipped with 10 sets of "activated carbon adsorption/ zeolite rotor + catalytic combustion" VOCs treatment equipment.

CRRC Qiqihar adopted a "dry filtration + activated carbon adsorption + catalytic purification" treatment process, ending with the oxidization and dissolving of VOCs exhaust gas into water and carbon dioxide.

CRRC Meishan upgraded the dust removal system of its No.1 electric arc furnace and shakeout machine to realize sealed cleaning, loading, unloading, and other operations to prevent secondary pollution. The primary air pipes of the dust removal systems of the No. 1 and No. 2 electric arc furnaces have also been cross-linked.

CRRC Zhuzhou Electric installed a set of "alkaline cleaning + dry filtration + activated carbon adsorption + catalytic combustion" exhaust gas treatment equipment.

CRRC Jinan and CRRC Taiyuan installed welding fume extraction equipment, while CRRC Electric Co., Ltd. completed the dust removal transformation of its finished vehicle sanding line and greatly improved the efficiency of its exhaust gas controls.

The main factory area of CRRC Tangshan has realized the improved treatment efficiency of soot and dust in its interior parts production line, improved treatment efficiency and transformation of the damp-proofing slurry of its customer inspection department, catalytic combustion of its anti-corrosion coating room, organized discharge of its putty workshop, and the in-depth treatment of fumes and dust in its riveting and welding workshop.

Water Conservation

CRRC has carried out sewage treatment, implemented a reclaimed water reusage system and reverse osmosis membrane treatment to realize the recycling of wastewater, applied a mutually beneficial strategy of water conservation, emission reduction, and wastewater recycling, and further enhanced the efficiency of water resource utilization.

CRRC has strictly implemented the regulations on the physical inspection of water treatment equipment and facilities, and has supervised and inspected the deployment of online monitoring equipment, cleaning of membrane components in sewage treatment liquids, and the application of chemicals for sewage treatment. Sewage treatment stations utilized biomembrane treatment for the processing of domestic wastewater. Discharged water pollutants were primarily standard amounts of chemical oxygen demand (COD) and ammonia. In 2021, the Company's COD emissions were 459.64 tons (-14.68% YoY), and ammonia emissions were 62.4 tons (-2.88% YoY).

Alleviation of water supply pressures — CASE

Tangsteel, a subsidiary of CRRC Industrial Investment, has closed all its deep groundwater wells in the southern area to maximize the protection of groundwater resources and ensure that it does not compete with the public for drinking water. Reverse osmosis membrane treatment has been adopted for sewage recycling and reuse, capable of providing up to 33,000 tons of demineralized water a day to Taigang Group for use in steelmaking, steel rolling, and other production applications. This has saved over 10 million tons of fresh water every year, and greatly alleviated the serious water shortages experienced by Taiyuan.

Solid Waste Management

CRRC has re-classified hazardous waste types, prepared an annual hazardous waste management plan, completed the record of hazardous waste, and entered into a hazardous waste transfer and disposal agreement to ensure its compliance in the legal disposal of hazardous waste. CRRC Sifang has formulated the *"Implementation Plan for the Solid Waste Management Enhancement Project"* and carried out refined waste management and reduction measures, reducing non-recyclable solid waste and hazardous waste output by 33% and 13% year-on-year respectively. CRRC Meishan carried out steelmaking resource recycling testing for steel grinding waste to reduce the generation of hazardous waste. Four pilot enterprises (including CRRC Tanshan and CRRC Chengdu) set an example for other enterprises by standardizing the transformation of hazardous waste warehouses, and standardizing and rectifying the hazardous waste temporary storage points in waste-producing workshops.

In 2021, the Company's hazardous waste disposal volume was 21,524.69 tons, handed over to qualified entities for disposal. General solid waste generation was 528,312 tons. The Company saved on 63,000 packaging boxes over the year, representing a total of around 15.75 tons.

Driving a green circular economy — CASE

In 2021, the CRRC green circular economy e-commerce platform (Yiqipai) thoroughly implemented the national policy requirements for peak carbon and carbon neutrality, overcoming the impact of the pandemic and taking advantage of current trends. The platform facilitated a total of 4,033 orders and added 1,686 new members. Through the empowerment of specialization, openness, innovation, and marketization, the platform significantly improved customer satisfaction and order processing efficiency in a manner that has been recognized by member companies and the industry as a whole. In its four years of operation, the platform has relied on the resource, brand, and location advantages of CRRC to achieve sustainable and healthy development, with a total transaction volume of around CNY 2.3 billion and premiums of over CNY 400 million.

Energy Conservation Technical Transformation

CRRC has strengthened its energy conservation technical transformation efforts. In 2021, the Company and its subsidiaries invested nearly CNY 300 million into technical transformations for energy conservation and environmental protection, and completed nearly 360 projects to realize energy conservation, consumption reduction, pollution reduction, and efficiency enhancement.

CRRC Datong changed its heating method from steam to hot water, reducing its heating energy consumption by **20%**.

CRRC Yangtze drove projects such as the replacement of its cutting gas with high-efficiency natural gas and transformation of its central gas supply for welding, reducing its annual consumption of standardized coal by **470** tons.

CRRC Meishan upgraded **9** of its air compressors and installed **5** units of dynamic reactive power compensation equipment, realizing annual energy savings of **1.7** million kWh.

Low-Carbon Products

Utilizing its advanced technologies and research capacity, CRRC actively developed more environmentally friendly equipment and products in line with its commitment to provide green, environmentally friendly, and intelligent low-carbon travel solutions to the world.

CSR Award

CRRC Yangtze's "New Energy Lithium Battery Refrigerated Container" won the

★

"Green Development Service Demonstration Case Award" at the 2021 CIFTIS.

CRRC QSYRI successfully launches its first new energy rail welding vehicle — CASE

The LR1200-BES new energy storage flash rail welding vehicle developed by the CRRC QSYRI replaces conventional internal combustion with an advanced energy storage supply, integrating energy storage power supply, single-phase high-power inverter, and full wave AC flash welding technology. The vehicle can be charged while welding, produces low noise and zero exhaust soot, and is characterized by a stable power output and high welding efficiency.

The new "Nanhu" tram helps Jiaxing go green — CASE

The new energy storage 100% low-floor tram developed by CRRC Changchun uses materials that meet the requirements of environmental protection standards, and are more than 90% recyclable. The vehicle utilizes entirely LED lightning to save on energy consumption and elastic rubber wheels to reduce noise pollution. During the entire operation process, 90% of the vehicle's regenerative braking energy can be fed back into the energy storage unit to realize high sustainability.

Forward kinematics testing completed for an energy-efficient permanent magnet direct-drive passenger electric locomotive — CASE

In December 2021, the high-power permanent magnet direct-drive passenger electric locomotive developed by CRRC Datong successfully passed forward kinematics testing. The test results showed that the total efficiency of the constant power area of the locomotive reached over 90%, while the energy consumption of the entire locomotive was reduced by around 4.5% when compared to conventional models. According to calculations based on existing locomotive traffic, each unit can save on around 220,000 kWh of power and reduce carbon dioxide emissions by around 200 tons per year.

CRRC Yongji Electric assists the successful sea trial of a 100% electric tour boat — CASE

In September 2021, the Kunming Dianchi "Dianjing" 100% electric catamaran tour boat equipped with a complete set of battery power systems, DC distribution systems, propulsion control systems, PMS systems, and other equipment provided by CRRC Yongji Electric successfully passed inspection and sea trial. The "Dianjing" is a 100% electric tour boat with the largest size and battery power in Dianchi Lake. The boat's 100% electric propulsion provides advantages such as high integration, strong reliability, high comfort, low noise, and zero pollution.

Bringing Talents Together to Build a Vibrant Team

Always putting people first, CRRC has developed a globally integrated human capital management system to protect employees' basic rights and interests as well as physical and mental health. Through multi-faceted training for employees in different positions, we spare no effort to expand their career paths and create an atmosphere where everyone can make the most of their talents. We help employees grow with the Company and fulfil their dreams.

Bringing Diverse Talents Together

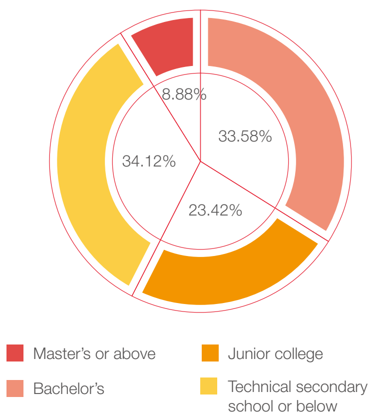
CRRC strictly abides by relevant laws and regulations, champions consultation on an equal footing and mutual benefit, and strives to build a harmonious and stable labor relationship.

Fair Employment

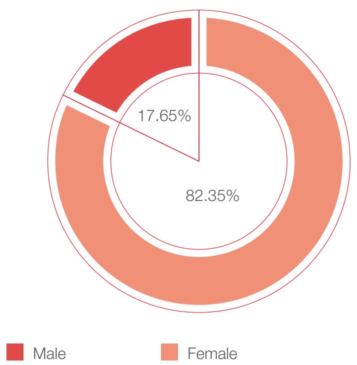
CRRC recruits employees in strict accordance with the requirements of the *Labor Law* and other laws and regulations, insists on equal employment, and resolutely eliminates the use of child labor and forced labor protects the legitimate rights and interests of employees, cares about their physical and mental health, and helps them grow with the Company. In 2021, CRRC had a workforce of 160,656, including 6,179 overseas employees and 28,355 females. 100% of employees were working under labor contracts.

CRRC safeguards the political, economic and cultural rights and interests of its employees. Leveraging the bridging role of the trade union and the Communist Youth League Committee, we strengthen the construction of talent teams of this kind and protect employees' rights to participate, vote and elect. In 2021, the trade union covered 100% of employees.

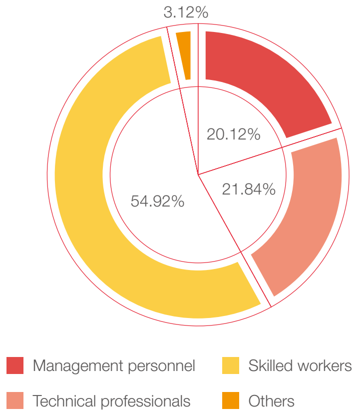
Percentage of employees by educational level



Percentage of employees by gender



Percentage of employees by competency



Compensation and Benefits

CRRC continuously improves its compensation and benefits system to provide employees with competitive renumeration and various forms of benefits. The Company is exploring a multi-factor distribution system that helps employees share the fruits of corporate development.

Deepening salary management	We implements a differentiated pay system and strengthens management over the salaries of company heads at all levels. We have made it clear that the percentage increase in average pay of the heads of a company should be less than 70% of the percentage increases in a) average profitability of the company; and b) average pay of its employees. The medium and long-term incentive operation manual was issued, and the standardized template of incentive plan was prepared. The incentive methods covered various modes such as equity and dividend incentives for technology-based enterprises, employee shareholding in mixed-ownership reform, equity co-investment, scientific and technological achievements transformation rewards, and excess profit sharing.
Providing diverse benefits	CRRC strictly implements national regulations on statutory leave, wedding leave, bereavement leave, maternity leave, etc., and provides employees with home ownership subsidies. The Company has also established a standard system for enterprise annuity and supplementary medical insurance.

Supporting Employee Growth

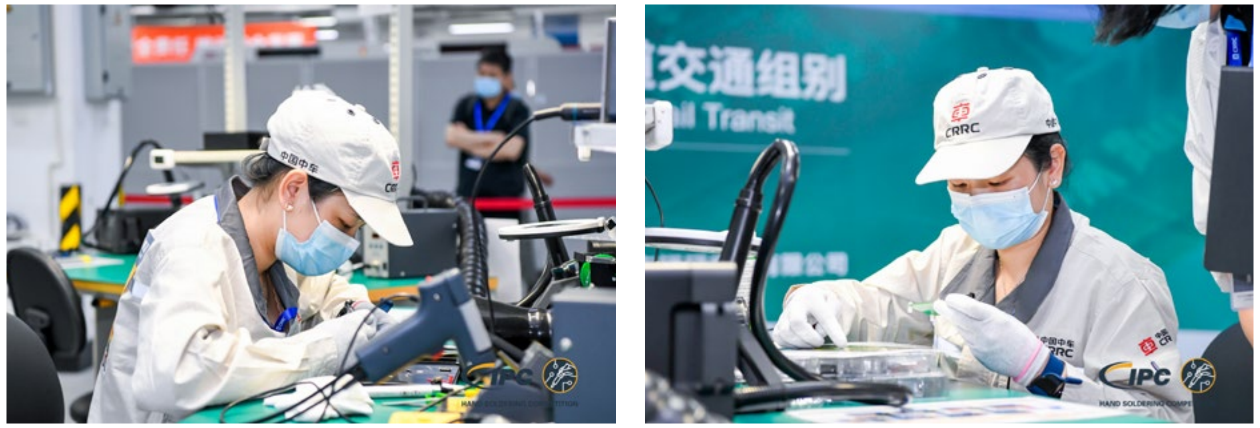
With capacity building top of mind, CRRC is building a scientific, standardized, open and inclusive talent development system based on new mechanisms, and expanding career paths to help employees fulfil their dreams.

Talent Management and Training

With the concept of "talents hold the key to a company's performance", CRRC is building a globally integrated human capital management system that focuses on "strategic guidance", "capability management", "position management", "platform support" and "implementation control". We have formulated the 14th Five-Year Plan for human resources, education and training, as well as the implementation methods for these plans. We have also put forward the general idea of the "11453" program for human resources.

On the principle of "systematization, integration, standardization and informatization", we have streamlined the systems for training management, training courses, and internal trainers, and built three training platforms - CRRC University (Party School), CRRC Online Academy, and an enterprise training base. Currently, we have set up one vocational college - Changzhou Railway Higher Vocational and Technical School, and are preparing for a new one - CRRC Vocational and Technical College. We are developing the "331" vocational education and training system and adopting online and offline forms to expand theoretical and practical training beyond classrooms and campuses.

In 2021, we held 2 training sessions for core management personnel, 2 sessions for core technical personnel and 4 sessions for core skilled workers. We also held 4 sessions on outstanding leadership and digitization, 2 sessions on digital technology and 1 session on management.



CRRC Sifang Institute hosted the first rail transit category of the 2021 IPC Hand Welding Competition

CRRC launches a China training base for WorldSkills — CASE

In August 2021, CRRC and other builders delivered the China Rail Vehicle Technology Training Base for the 46th WorldSkills Competition. The training base was built in accordance with the WorldSkills standards and equipped with multiple sets of equipment. CRRC was also responsible for comprehensive management and coordination of the corresponding training projects. It has set up a leading group and put together a technical team to prepare the training plans, develop more than 20 volumes of tutorials, establish five supporting teams and organize training for 580 participants per day.

Smooth Career Paths

CRRC has developed solid career paths, continuously strengthened talent management and selection, and established a talent incentive mechanism. In so doing, the Company has enhanced work ethic and created a positive work environment. To step up efforts to restructure our team of industrial workers as required by the new era, we have formulated the *Guiding Opinions on Further Building the Team of Skilled Workers*. Our experience in nurturing talents well-versed in both theory and practice has been selected in *State-owned Assets Exchange*. We have started piloting the "1 + X" system for vocational skills level certification across the Company. To give our talents greater scope, we have formulated and implemented the *CRRC Action Plan for Building an Outstanding Young Team of Management Personnel (2021-2025)*. As far as Tier 1 companies go, the post-75s who became chiefs and the post-80s who became deputies in 2021 accounted for 38% and 31% respectively of the total promotions.

Zhang Ruyi of CRRC Dalian - takes care of the last pass before the locomotive leaving the factory

Zhang Jinghua, the representative of the National People's Congress of CRRC Qiche, returned from her duties and brought the spirit of the two sessions to the grassroots as soon as possible

Caring about Employee Health

CRRC has laid down the 14th Five-Year Plan for workplace safety and drawn a blueprint for smart safety management. As required by relevant laws and regulations, we have fully implemented the *Regulations on Employee Health Management*, advocated "massive health", and promoted integrated management of occupational health, physical health and mental health based on the prevention and control of occupational diseases. In 2021, we had zero fatal workplace accident, zero fire and explosion accident, zero new work-related disease among current employees, and zero cluster infection; 7,419 days lost due to work-related injuries.

Safety Blueprint

According to the *14th Five-Year Plan for workplace safety*, by 2025, we plan to develop CRRC into a world-class company featuring a beautiful workplace, a talented team, and a high level of intrinsic safety that is easy to manage and maintain.

We have completed the overall and technical framework design for our smart safety management platform. Under the framework of epidemic prevention and control, we are promoting a snap-to-upload system for risk identification and management and an approval system for nine types of hazardous operations across the board. We have fully integrated the double prevention mechanism of CRRC Tangshan into our smart safety management platform. The mechanism is currently being tested for effectiveness.

Workplace Safety

CRRC gives top priority to safety and prevention. We have accelerated safety recap and ensured full coverage of our safety level evaluation system. We have also established the double prevention mechanism (risk classification and identification), strengthened safety publicity and control over key links, and improved employees' safety awareness and skills.

Workplace Safety Management

Streamlining the workplace safety management system

We are carrying out a three-year workplace safety operation; revising and adding management rules, contingency plans, on-site emergency response protocols, and other safety codes and standards; and improving our "3-in-1" risk prevention system (by personnel, by physical conditions and by technologies) to consolidate the foundation of our unique "safety superstructure".

Carrying out safety level evaluation

Our safety level evaluation has covered 27 companies so far, including three 1B and six 1C companies. Improvements have been seen in five aspects, namely the safety awareness of leaders, intrinsic safety, safety management coverage, basic safety management, and management of related parties.

Workplace Safety Inspection

Supporting major events

Regarding our subsidiaries in Beijing, we have carefully inspected their safety, environmental and anti-epidemic measures, set up a special team for safety monitoring and guidance, and promptly released the rules for epidemic control, fire and electricity use, traffic safety, storm response and more.

Launching special rectification campaigns

We have carried out 6 special rectification campaigns targeting combustible dust, shunting operations, etc. These campaigns have covered 370 kinds of dangerous chemical and explosive products under 7 categories, 1,541 off-site service depots, 138 ongoing projects, 1,805 outdated facilities, and 64 locations where combustible dust builds up.

Examining safety hazards

We have screened, assessed and managed major safety risks, and promoted the snap-to-upload system for risk identification and management across the board. We are currently testing the double prevention mechanism for effectiveness. So far, we have created 761 risk control lists, identified nearly 40,000 safety risks, and managed more than 2,000 hazards.

Workplace safety input

CNY **850.95** million

Safety training coverage

123,405 person-times

Safety Culture

Carrying out safety education

We have written *The Way of Safety Management*, revised the *Collection of Typical Cases of Workplace Accidents*, and created relevant videos. We have also organized a forum on workplace accidents, where some 100 members of CRRC's safest units benchmarked themselves against global best practices and drawn on proven experience in safety management. Specifically, we have collected 152 typical cases of workplace accidents and created 36 videos concerned, organized 48 lectures on safety across the Company, and trained more than 4,400 people.

Promoting safety culture

We strive to improve safety awareness and skills by organizing activities for the Workplace Safety Month, bringing employees together to watch videos and attend lectures on safety, and exemplifying the safety culture across the Company. So far, we have organized 467 lectures on workplace safety. The total number of participants is 38,387. In particular, 2,723 participants attended 165 lectures on the important remarks about workplace safety by General Secretary Xi Jinping.

Occupational Health

CRRC pays heed to employees' occupational health and signs the *Commitment Letter of Benchmarking for the Construction of Healthy Enterprises*, and formulates an occupational health enterprise plan. We have organized training on "healthy company" construction and occupational health evidence collection for 122 managers, and conducted health survey for 180,000 employees. We have also protected employees' physical and mental health and raised their occupational health awareness by setting role models, collecting promotional works, and lecturing on the prevention and treatment of occupational diseases. In 2021, 100% of employees received an annual health checkup.

COVID-19 Epidemic Prevention and Control

In 2021, the COVID-19 epidemic occurred on multiple points with sporadic cases in some places across the country, and the regional epidemic prevention became the norm. In order to ensure the safety of its employees and stakeholders, CRRC fully and accurately implemented the prevention and control measures of "tackling both imported and domestic infections", and endeavored to make great efforts in the epidemic prevention and control of enterprises, especially those stationed in Beijing. In 2021, CRRC achieved zero infection of the COVID-19 epidemic.

CRRC made systematic planning, followed the overall arrangement of "135" epidemic prevention, and persevered in adopting the good and effective practices summarized in the early stage to guide the epidemic prevention work. In view of the local sporadic cases and clustered epidemics, CRRC conducted real-time monitoring of the evolution of the pandemic, continued to apply the mechanism of "management responsible for overall arrangement, each department or subsidiary responsible for their own work, and professional efforts related to epidemic prevention being coordinated across the Company"), obeyed the rules of "5511"and "five prohibitions", managed to achieve timeliness in five aspects, and focused on personnel screening, vaccination and disinfection of international mails. In view of the sporadic local epidemic situation, CRRC conducted over 80 screenings in 2021, covering a total of more than 24 million people.

The epidemic prevention and control of CRRC shall abide by the following principles

Four Musts

It means that CRRC must: implement the prevention and control strategy of "normalization + emergency response"; carry out the prevention and control mode of "joint prevention and control" and "measures targeting people and objects simultaneously to fend off infections"; put the working mechanism of "leaders taking charge of a working group and being on duty" into place; and keep disciplined attention to detail.

Two Lines of Defense

It means that CRRC should be strict adherence to the overall defense line of epidemic prevention and control of the Party and the state; and continue to strengthen the internal defense line of epidemic prevention and control of the Company.

Three Policy References

That is, the overall epidemic prevention and control policies for the cities within the medium and high-risk regions shall be adopted by reference to those implemented by these regions ; the epidemic prevention and control policies for the vehicles and flights which stop or transfer at the cities within the medium and high-risk regions shall be adopted by reference to those for the close contacts with the personnel in these regions; the epidemic prevention and control policies for co-residents and visiting family members shall be adopted by reference to those for the employees.

Seven First Times

That is, take the following actions at the first time: forwarding the information of epidemic occurrence, clarifying the screening requirements, feeding back the screening results, identifying and assessing the prevention and control risks, making prevention and control decisions, responding to the requirements of relevant authorities for enterprises, and reporting special matters as required.

Building a Happy Big Family

CRRC always pays attention to employees' needs and cares about their physical and mental health. We help our employees balance work and life and strive to enhance their sense of belonging by creating a harmonious, healthy and loving work environment.

Caring about physical and mental health

We try to understand employees' needs through in-depth surveys, take care to visit the families of overseas employees, and help needy and female employees and those on the front line. We are doing everything we can to improve the sense of belonging and happiness of our teammates.

Each season and each holiday, we provide assistance and care for employees and families who are having a hard time. We pay close attention to their diverse needs and strive to solve their real-world problems.

We have set up a committee for female employees, and committed ourselves in writing to solve their problems in work and life. We have organized a month-long campaign to help female employees protect their rights and interests. We have also promoted female role models and lectured on how to live wisely.

Balancing work and life

To enliven the cultural life of employees, we have organized online/offline calligraphy, photography, singing and speech contests as well as ball games. These activities are popular, healthy, and good for team spirit. We strive to build our cultural and art festival into a morale-boosting signature campaign.

CRRC Jinan was hosting the March 8 Fun Relay Race

CRRC Tangshan was hosting the CRRC 140th Anniversary Torch Relay

Focusing on People’s Livelihood

CRRC is committed to rural revitalization, epidemic prevention and control, and flood relief. Our employees are keen to serve local communities and ready to go where they are most needed. In order to prevent and control the epidemic, CRRC donated CNY 10.1 million to all sectors of society throughout the year.

Striving for Rural Revitalization

CRRC resolutely implements the decisions of the CPC Central Committee and the State Council, and promotes the effective integration of poverty eradication and rural revitalization. We never waver in the policy of pairing assistance. Nor will we slacken our pace until it is fully implemented. An increasing number of employees are passionately working in rural areas. Meanwhile, we are constantly looking for new ways to help local communities.

In 2021, CRRC continued its partner assistance to Jingxi City and Napo County in Guangxi Zhuang Autonomous Region, and Maiji District and Gangu County in Gansu. The Company also answered SASAC's call to help Wei County in Hebei and Baise City in Guangxi. We take concrete steps to consolidate and expand upon the outcomes of the fight against poverty as part of our efforts to promote rural revitalization, so that the foundations of poverty eradication are more solid and the effects are more sustainable.

In May and June 2021, a delegation led by CRRC Chairman Sun Yongcai was conducting onsite survey in Baise (Guangxi) and Tianshui (Gansu), as part of the Company's pairing assistance campaign

In August 2021, Lou Qiliang, President of CRRC, was conducting onsite survey in Maiji District and Gangu County, Tianshui, Gansu Province

Self-directed investment in targeted assistance areas

CNY 15,250,700

Attracted investment in targeted assistance areas

CNY 673,200

Primary-level officials participating in trainings

62

Local rural revitalization leaders participating in trainings

21

Technical personnel participating in vocational skills trainings

308

Products from targeted assistance areas we purchased

CNY 35,217,000

Products from poverty eradication areas we helped sold

CNY 13,373,500

Industrial Support

We leverage our resources and industrial strengths to ensure our industrial assistance campaigns are going deeper and finding more success in helping local communities survive and thrive.

Newly-launched Cooperation Projects

- CRRC and Baise City entered a Coopertion Framework Agreement on deepening cooperation in wind power industry, new materials and cadre training based on a market-oriented mechanism.
- CRRC, CGN, and Baise Municipal Government signed a CNY1.8 billion Memorandum on New Energy Cooperation.
- CRRC Nanjing Puzhen and Jingxi City signed a Cooperation Agreement on a CNY1.1 billion tourism-oriented rail transport project (Phase I).

CRRC-aided Industries Across China

- CRRC helped build a national Miao embroidery workshop in Shibadong Village, Huayuan County, Xiangxi Tujia and Miao Autonomous Prefecture, putting together a complete industry chain for the intangible cultural heritage.
- CRRC helped the pepper industry to thrive in Shiping Village, Gangu County, Tianshui City. It explored an operation mode of "farmers + cooperatives + CRRC-aided workshops" to ensure the sustainability of industry chain.
- In Wei County, Handan City, CRRC focused on improving the technical and quality control capabilities of locknut manufacturers
- In Guangming Village, Pingba District, Anshun City, CRRC helped set up and fit out a purified water plant that produces bottled and barreled water for villagers.

Marketing Support

We serve as a bridge - and sometimes a platform - for targeted assistance areas. We help agricultural brands and specialty products sell far and wide, bringing substantial benefits to the needy.

Marketing

CRRC signed a strategic agreement with China Construction Bank and Agricultural Bank of China on marketing aid. Thanks to CRRC Charity Shopping and CRRC Smart Mobility, high-quality produce from four targeted assistance areas can now be sold directly on the platforms of the two banks and central enterprises.

Promotion

CRRC engaged four targeted assistance areas in a Company-wide produce marketing campaign that logged CNY1.62 million in sales. Brands such as "Caotan Village Honey", "Huaniu Apple", "Daxiang Glutinous Rice" and "Passion Fruit" are among the favorites of CRRC employees.

Self-purchase

Local clothiers sold 22,200 sets of uniforms to CRRC, earning CNY3.06 million. CRRC employees planted 560 fruit trees in rural areas. The produce bought from targeted assistance areas were distributed in the form of employee benefits.

Infrastructure Support

CRRC continues to build essential public infrastructure for targeted assistance areas. As public services improve, local residents are feeling happier and more fulfilled.

- CRRC Dalian financed the construction of bridges and dams for Changju Village, Zhuanghe County, Dalian City
- CRRC Tangshan built a cultural square for Beigou Village, Longhua County, Chengde City
- CRRC Jinan donated CNY98,000 to Hezheng County, Linxia Hui Autonomous Prefecture, for the construction of roads, water and electricity infrastructure, and more
- CRRC Yangtze Tongling helped launch an intra-village road project in Shaofeng Village, Zongyang County, Tongling City

Intellectual and Emotional Support

Putting talents first, CRRC has strengthened intellectual and emotional support for targeted assistance areas and locals in need. We strive to improve the professional skills and generic competencies of grassroots cadres who we believe are the backbone of sustainable development.

Training rural revitalization leaders	"Tian'e Program", CRRC's rural leadership development program, has trained 83 town/township officials and rural revitalization leaders. We have also trained 308 technical talents from rural areas by organizing study tours around our campuses or sharing business ideas of developed regions like Jiangsu and Zhejiang. Such training proves to be effective, both ideologically and professionally.
Reinvigorating rural education	We have donated sportswear and school supplies to teachers and students at the CRRC Hope Primary School in Maojiaping, Gangu County, and done some renovation for other Hope Primary Schools there. We have enabled multimedia teaching at Caotan Primary School. We have also invited university entrants from pair rural areas to visit the national high-end equipment development base, encouraging them to become big dreamers and future leaders.

Caring about Community Development

CRRC proactively practices its social responsibility by engaging with local communities and organizing various forms of social welfare activities, among others.

Community Engagement

Through such events as open houses and "Introducing Fans to the CRRC", we help the public learn about our history and mission from different perspectives, deepen their understanding of "China speed", and draw attention to the development of rail transport.

CRRC Times Electric (Australia) holds Online Open Day — CASE

In November 2021, CRRC Times Electric (Australia) held an Online Open Day under the theme "Better Traveling, Better Connected". The event took viewers on a sightseeing virtual train tour around Australian cities. It also showed CRRC's concrete efforts to engage with local communities and develop local communities through win-win cooperation. News about the extensively covered event was published in Chinese and/or English on traditional and social media platforms worldwide.

CRRC meets fans in Yibin — CASE

In June 2021, CRRC held its 10th meet-and-greet in Yibin City, Sichuan. More than 30 invited guests (car fans) from different industries and different parts of the country experienced the city's trackless Autonomous Rail Rapid Transit (ART) system and visited the workshop where the smart railways were made.

Students from 20 foreign countries visit CRRC Qiqihar

CASE

In July 2021, a delegation of 70-odd students from 20 foreign countries visited CRRC Qiqihar to experience the charm of China's rail equipment industry up close. During the visit, these students (some of them are from countries along the Belt and Road Initiative) were amazed at the rapid development of China's equipment manufacturing industry. They also learned more about China's realities.

Epidemic and Disaster Relief

We care about our society and stand ready to serve. In 2021, for example, we contributed money, materials, and personnel to fight the flash floods in Henan and the occasional outbreaks in China.

Supporting flood recovery in Henan

CASE

In July 2021, many places in Henan suffered extremely heavy rainfall. Shortly after the floods occurred, CRRC donated CNY10 million to the affected areas for disaster relief and reconstruction, while its subsidiaries wasted no time sending materials and personnel to the flooded city of Zhengzhou. CRRC managed to restore normality to the affected areas by repairing water-damaged equipment, cleaning up the environment, producing spare parts and components, and guaranteeing rail transport in cooperation with local governments.

CRRC employees were helping to drain flood water in Anyang, Henan

Social Welfare

Insisting on sharing the fruits of corporate development with society, CRRC organize volunteer services and pay attention to the development needs of local communities.

CRRC's volunteers advocate good manners at major bus stops

CASE

In October 2021, CRRC New Infrastructure Investment Wuxi Project Company launched a month-long volunteer campaign. Every weekend saw 100 volunteers from the company advocating good manners at 16 major bus stops along the Wuxi-Jiangyin Line. The volunteers urged passengers to board the bus in an orderly manner. They were always ready to give physically challenged passengers a hand up.

Caring for children with intellectual disabilities

CASE

In August 2021, volunteers from CRRC DLRI visited children with intellectual disabilities at a local rehabilitation and education center. Both the volunteers and the kids had a great time together. As songs of joy filled the air, the center felt like a real home.

Group photo of volunteers and kids

Organizing voluntary blood donation

CASE

In 2021, CRRC Qingdao Sifang Institute was named a “major blood donor in Qingdao”, as 339 of its employees donated about 106,800 ml of blood to medical institutions and patients.

Voluntary blood donation by an employee

Implementing the "Five Localizations" Model

CRRC is consistently building the "five localizations" model with stakeholders on a win-win basis. Driven by the mission, "Connecting the World through Better Mobility", we are restructuring our overseas resources to provide global customers with life cycle systematic rail transport solutions.

CRRC ZELC-Vossloh receives building and maintenance orders

CASE

Acquired by CRRC ZELC in 2020, Vossloh is Europe's leading locomotive manufacturer and integrated service provider. It has about 500 people on the payroll. In 2021, the newly-incorporated rolling stock manufacturer CRRC ZELC-Vossloh launched the "building + maintenance + leasing" package service, which achieved profitability before year-end and made a breakthrough in the European market. According to its framework agreement with RIVE, another European company, CRRC ZELC-Vossloh is responsible for providing and maintaining zero-emission dual-power shunting locomotives, which are planned for use in the Netherlands, Germany and other places.

"The hybrid shunting locomotives emit zero carbon during their operations. We can keep the locomotives in good shape by offering the agreed maintenance services."

- Dr. Bernd Hoppe, President of CRRC ZELC-Vossloh

Mombasa-Nairobi SGR life cycle maintenance wins "Demonstration Cases: China Services" Award

CASE

CRRC Qiqihar's Mombasa-Nairobi SGR life cycle maintenance project will take care of all the freight trains serving along the Kenyan standard gauge railway for the 10 years starting 2017. It is mainly responsible for locomotive inspection, temporary repair, section repair, equipment maintenance, after-sales services and localization. The project received the "Demonstration Cases: China Services" Award from CTFTIS. CRRC Qiqihar is pushing ahead with localization and China-Kenya cultural integration. It is creatively practicing new ways and new ideas of services. So far, it has trained 96 Kenyan employees who have passed all exams and are able to work independently.

Based on its strengths in diesel locomotives, CRRC QSYRI has won the building and maintenance contracts for 56 trains serving along the Mombasa-Nairobi SGR. Since the SGR introduced double-stack container trains in February 2021, CRRC QSYRI's Type DF8B Freight Diesel locomotive for Kenya has withstood the test of mounting freight volume and maintained good performance. As a result, the SGR saw a 28% increase in freight volume year-on-year. In Kenya, CRRC QSYRI has also set up a maintenance division and opened the 4S store for professional, efficient and reliable locomotive maintenance services.

Exerting great efforts in overseas anti-epidemic initiatives

CASE

In 2021, COVID-19 accelerated mutation and the international epidemic situation was extremely complicated. CRRC has stationed or local staff in more than 50 countries and regions overseas. Due to different cultures and languages, different epidemic prevention policies and limited navigable logistics, there are great challenges in overseas epidemic prevention.

We responded to the overseas epidemic prevention requirements of the State-owned Assets Supervision and Administration Commission of the State Council (SASAC), and continued to fight the battle of epidemic prevention and control with the "12345" (the group strictly implemented the overseas epidemic prevention and control work deployment of SASAC, and formed the "12345" overseas epidemic prevention and control mode with CRRC characteristics, which was affirmed and praised by SASAC) mode, so as to ensure the safety of overseas employees and the orderly operation of the project. We insisted on completing the daily epidemic prevention and control report to SASAC, the three issues of epidemic prevention and control briefing of the Company on a weekly basis and the isolation statistics of personnel returning from overseas. We vigorously carried out video inspection, and organized our subsidiaries to participate in the overseas epidemic prevention and control video inspection meetings organized by the SASAC, as well as the overseas video meetings for employee care and epidemic prevention & control inspection organized by the Company. In 2021, we made a total of 27 video inspections, covering more than 30,000 persons, and were awarded by the SASAC twice. In addition, by holding cloud games, implementing humanistic care and doing a good job in the orderly rotation of expatriates, we have ensured the mental health and emotional stability of employees.

Improving Corporate Governance and Stabilizing Operations

CRRC continues to improve corporate governance and risk control. We firmly believe that compliance and transparent operation are keys to long-term business growth, and seek to provide strong impetuses for the recovery and sustainable development of the world economy.

Improving Corporate Governance

CRRC has standardized its two-level Board of Directors. The improved system of full-time external directors gives scientific decision-making and corporate governance a boost.

Standardizing the Board of Directors

Seeing the Board as the prime mover of corporate governance, we prepared Board meeting plans at the beginning of 2021 and clarified the key dates. Throughout the year, the Board focused on smooth communication with external directors, making sure the Board meetings were held and voted cast according to rules. It also strictly screened the proposals to ensure scientific and efficient decision-making. In 2021, CRRC held 11 Board meetings in which 47 issues were approved.

Optimizing the subsidiary governance system

We have issued the *Guiding Opinions on Standardized Construction of Subsidiaries' Board of Directors*, itemized the 174 companies that needed to establish the Board (in some case, urgently), and guided our companies to standardize the Board and improve their charters, rules of procedure, and lists of matters to be decided. We have also organized special training on corporate governance and compliance for our listed companies.

Streamlining the system of full-time external directors

We have revised the *Rules for Full-time External Directors and drafted the Performance Guidelines for Full-time External Directors*. Currently, we have 26 full-time external directors who served a total of 90 personnel in 30 subsidiaries. We have improved our performance guidance and the bimonthly meeting system, and built an information platform where full-time external directors can share their work experience and ideas and, through monthly reports and survey feedback, reveal the operational and development constraints as well as typical practices of the companies to which they are posted.

In 2021

Held Board meetings
11

Issues were approved
47

Full-time external directors
26

The Board of CRRC has been rated "Outstanding" by SASAC for three consecutive years.

Strengthening Internal Control of Risks

Reforming the audit management system

We have put in place the "1 + 1 + N" integrated audit supervision and management system, and set up a shared audit center with four sub-centers (dedicated respectively to economic responsibility, management and efficiency, offshore business, and computer audit), thus integrating audit resources and promoting the overall improvement of audit work.

Optimizing risk control

To highlight risk appetite as the key to risk control, we have issued the *Risk Appetite Management Measures* and supporting guidelines, formulated the 2021 Risk Appetite Statement, set the business bottom line and selected monitoring indicators. We have also written the *Guidelines for Comprehensive Risk Management in International Business*, the *Export Risk Management Guide* and the *Guide for Policy-oriented Export Credit Insurance*, and promoted strategic cooperation with SINOSURE to help CRRC navigate risks in international markets.

Reinforcing accountability

We have streamlined our accountability system and made comprehensive and detailed implementation plans. At a seminar held by the SASAC Bureau of Supervision and Accountability in July 2021, CRRC shared its experience and insight regarding how central enterprises can hold rule-breaking operators and investors accountable.

Running the Company according to rules

We have conducted legality review on CRRC's rules, revised the *Interim Measures on Commission Management*, and drafted four special rules, namely the *Measures for External Law Firm Management*, the *Interim Measures for Major Project Management*, the I*mplementation Rules for Overseas Project Commission Management*, and the *Measures for Trademark Management*.

Improving internal control

In July 2021, we started implementing the *Internal Control Matrix and the Authority Guidelines*. We have sorted out 27 primary processes, 116 secondary processes and 60 tertiary processes, clarified the 15 authorities of CRRC headquarters, and organized the training of internal control liaison persons at the departmental level. To enhance integrity awareness and press ahead with anti-bribery and anti-corruption tasks, we have held a Company-wide Party building and anti-corruption meeting, facilitated the development of a Party rules and disciplines promotion system, and organized the admonitory conference for CRRC's cadres.

Managing Investor Relations

CRRC is committed to establishing close ties with the public in a truthful, transparent and open manner. We aim to create a favorable external environment and gain more support for corporate development by extending the breadth and depth of information disclosure and social interaction.

Disclosing in-depth and detailed information

We have formulated and revised 5 rules for disclosing information on the stock market, bond market and interbank market, standardized the processes of disclosing information on the bond market and interbank market and strengthened the compliance audit of relevant documents. In line with the regulatory requirements, we have been disclosing information in a timely manner. For 6 consecutive years, we have received an "A" rating in the Shanghai Stock Exchange's evaluation on information disclosure. We have also won international top awards for annual reports.

Communicating with a wide cross-section of society

We have built a multi-level investor management platform, held annual/semi-annual/Q3 performance conference calls, and communicated with nearly 100 analysts and investors on business operation, order books, overseas markets, etc. We have participated in the Collective Reception Day event for listed companies in Beijing, offering detailed answers to the questions from investors and capital market stakeholders. We have coordinated and planned exchange meetings with key shareholders, ensuring that the proposal on related party transactions was easily voted through at the shareholders' meeting. Our 2020 annual report earned CRRC the Award of Best Practices in performance announcement. The Award is granted by the China Association for Public Companies upon the consultation with the agencies under CSRC. We are among the 200 winners chosen based on the recommendations from a national pool of more than 4,000 listed companies.

Outlook for 2022

The year 2022 marks the 20th National Congress of the CPC. As profound changes unseen in last century combine with the once-in-a-century pandemic, China's economic development is facing pressure from demand contraction, supply shocks and weakening expectations. For many years, the three types of pressure have never occurred at the same time. On the Company front, new and bigger challenges lie ahead. CRRC will implement China's new development philosophy completely, correctly and comprehensively. We will accurately understand the new development stage, proactively integrate into the new development paradigm, and build new strengths in an all-round manner to achieve high-quality development.

Progressing steadily towards high-quality business development

We will focus on developing new equipment for major rail projects and building technology and management systems covering the full life cycle, with a view to consolidating our strengths in core business through hi-tech products and high-quality services. Riding the "Internet plus" momentum, we will further extend our business towards life cycle services and seek to become a systematic solution provider. Also, we will make deep inroads into strategic emerging industries. On one hand, we are expecting significant growth from wind power, new materials, etc.; on the other hand, we hope our steady progress will translate into a qualitative leap in business fundamentals.

Jointly promoting the high-quality development of the industrial ecosystem

We will take procurement management up a notch, carry out extensive industry exchanges and strategic cooperation, and join hands with upstream and downstream partners and peers to promote the high-quality development of rail transport. In response to the Belt and Road Initiative, we will implement the "five localizations" model and assume "four roles" while serving global customers. These efforts will bring us closer towards the mission, "Connecting the World through Better Mobility".

Pursuing low-carbon, high-quality development through green transformation

We will carefully implement our "dual carbon" action plan by keeping a tight rein on energy-intensive projects with high emissions. We will strive to avoid wastes, control risks, and focus on core business. We will fully integrate low-carbon, carbon-neutral and carbon-negative technologies into the industry chains, value chains and technology chains, and spare no effort to promote eco-friendly innovations. Staking our claim to the title of "green" company, we will step up efforts to develop green products and facilitate the application of lightweight materials, high-efficiency energy storage systems and clean emission technologies.

Contributing to the high-quality development of society and people's livelihood

People-oriented, as always, we will protect the rights and interests of employees, make the best use of their talents, and enhance their sense of happiness, gain and accomplishment. We will solidify the foundation and provide impetuses for rural revitalization through pairing assistance. Also, we will share the fruits of business development with our society, proactively carry out and participate in public welfare campaigns, and pay it forward with a heart full of gratitude.

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Feedback from Readers

Dear readers,

Thank you very much for reading the 2021 CRRC Social Responsibility Report. We pay great attention to and expect to hear your feedback on CRRC's management, practice and reporting of social responsibility. Your comments and suggestions will help us to continue promoting the management and practice of corporate social responsibility. We look forward to your reply!

Multiple-choice Questions (please tick √ in the appropriate box)

1. Does the Report reflect the significant influence of CRRC on economy, society and environment?

☐ Yes ☐ Somewhat ☐ No

2. Do you think the relation analysis of stakeholders hereof and CRRC is accurate and comprehensive?

☐ Yes ☐ Somewhat ☐ No

3. Was the information provided in this report comprehensive?

☐ Yes ☐ Somewhat ☐ No

4. Was the information provided in this report readable?

☐ Yes ☐ Somewhat ☐ No

Open Question

Please address any opinions and suggestions on the 2021 CRRC Social Responsibility Report.

____

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Your Contact Information

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